

APPENDIX A

Biological Survey Report



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BIOLOGICAL SURVEY REPORT EL CENTRO FENCE REPLACEMENT PROJECT

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Abbreviations

AOR	Area of Responsibility
BLM	Bureau of Land Management
BMP	Best Management Practices
Cal-IPC	California Invasive Plant Council
CBP	Customs and Border Protection
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Database
CWA	Clean Water Act
DHS	Department of Homeland Security
ESA	Endangered Species Act
FTHL	Flat-tailed Horned Lizard
OHWM	Ordinary High-Water Mark
PBS	Peninsular Bighorn Sheep
POE	Port of Entry
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey

1. Introduction

Bio-Studies has prepared this Biological Survey Report in support of Northland Research Inc. to provide the Department of Homeland Security (DHS) and Customs and Border Protection (CBP) with a summary of information collected from a variety of literature sources and field surveys to describe the biological resources present and potentially present along the El Centro Fence Replacement Project (Project) in Imperial County, California. This report provides the necessary current conditions information for an evaluation of the potential impacts of the Project and associated activities on the area's biological resources and provides recommendations for avoidance or reduction of these impacts, including best management practices.

2. Project Description

Customs and Border Protection propose to replace existing vehicle and pedestrian fence totaling approximately 15 miles with new bollard fence in the Calexico Station Area of Responsibility (AOR) within the CBP El Centro Sector. The proposed construction corridor will be 60 feet wide and within the Roosevelt Reservation. The replacement fence will be bollard style fence comprised of 6-inch diameter steel bollards, spaced 4-inches apart and will be 30 feet high. The Project will include repairs and improvements to the existing patrol road, installation of a fiber optic cable for communications, installation of LED lighting, and installation of electrical utilities to supply power to the lighting and communications cable.

The Project is located along the southern edge of the U.S Portion of the Yuha Desert in Imperial County, California. The eastern terminus of the Project is 9.70 miles west of the Calexico West Port of Entry (POE) and extends west to the base of the Jacumba Mountains (Figures 1 and 2). The Survey Area for this Project consists of a 60-foot corridor extending north from the existing vehicle and pedestrian fence along the entirety of the Project. The majority of the Survey Area follows the main patrol road along the international boundary and is previously disturbed.

3. Survey Methods

3.1. Background

The potential for occurrence of special-status species in the Survey Area was evaluated by first determining which special-status species are known to occur near the Survey Area through literature and database searches. Special-status species include species that are listed as endangered or threatened at the Federal or State level, and California Department of Fish and Wildlife (CDFW) species of special concern. Database searches for known occurrences of special-status species focused on the Survey Area's U.S. Geological Survey (USGS) quadrangles (Coyote Wells, Yuha Basin and Mount Signal) and more specifically focused to within one mile of the Survey Area. The following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur near the Survey Area:

- California Natural Diversity Database records (CNDDDB 2019)
- California Native Plant Society Inventory of Rare and Endangered Plants of California (CNPS 2019a)
- United States Geological Survey 7.5-minute quadrangles Coyote Wells, Yuha Basin and Mount Signal (USGS 1972)

- NatureServe (NatureServe 2019a)
- U.S. Department of Agriculture Natural Resource Conservation Service Soil Survey Data (Soil Survey Staff 2019a,b)
- Bureau of Land Management California Special-Status Animal Species and Sensitive Species List (BLM 2014).

The literature search identified 52 special-status species whose potential occurrence needed to be evaluated within the Survey Area. Site visits were conducted in July 2019 to identify suitable habitats for special-status species. Habitat conditions observed in the Survey Area were used to evaluate the potential for occurrence of special-status species based on these searches and the professional expertise of the investigating biologists. The potential for each special-status species to occur in the Survey Area was then evaluated according to the following criteria:

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements. For wildlife, this is based on a lack of one or more essential habitat elements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime). Species surveys are not considered necessary.

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site. Species surveys are not considered necessary but may be performed to confirm species absence.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site. Species surveys may be necessary to determine presence, extent, density, and details of species distribution.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site. If species surveys are not conducted, then it is recommended the species is assumed present. Species surveys may be necessary to determine extent, density, and details of species distribution.

Present. Species was observed on the site or has been documented recently as being on the site. Focused species surveys may still be needed to determine extent, density, and details of species distribution.

4. Site Assessments

Site assessments including jurisdictional assessments, rare plant surveys, and general biological surveys, were conducted between July 9 and 12, 2019. Vegetation mapping was conducted with the use of a sub-meter global positioning system and aerial photographs. During all surveys and site visits, biologists documented all plant and wildlife species observed incidentally. The Survey Area was delineated by the Normandy vehicle barricade to the south and extended 60 feet to the north following the main patrol road. Biologists were instructed not to cross the vehicle barriers as a safety precaution during surveys, even when the main patrol road turned north and away from the U.S./Mexico international border. The main patrol road veers away from the U.S./Mexico international border at the base of Signal Mountain for approximately 1.20 miles, this area was not included in the survey effort.

The site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity, in order to determine its potential to occur in the Survey Area.

Biologists used their best professional judgement using the information and conditions available to make an assessment. Surveys were conducted outside the optimal period when annual special-status plant species and special-status wildlife would have been detected.

In cases where little information is known about species occurrences and habitat requirements, the species evaluation is based on the best professional judgment of the biologists with experience working with the species and habitats.

5. Environmental Setting

The Survey Area is located immediately on the United States/Mexico international border, approximately 9.70 miles west of the Calexico West POE. The 15-mile Survey Area lies between private property and agricultural lands at the western edge of the City of Calexico and the base of the Jacumba Mountains to the west. The majority of the Survey Area is located within the Yuha Basin, an Area of Critical Environmental Concern as designated by the Bureau of Land Management (BLM), and is flanked by the Jacumba Wilderness Area to the west and private property and agricultural lands to the east. The Survey Area falls within the Sonoran Basin and Range Ecoregion and three Level IV Ecoregions: Western Sonoran Basin, Western Sonoran Mountain Woodland and Shrubland, and Imperial Valley/Lower Coachella Valley (Bailey 1995; Griffith et al. 2016). These ecoregions are characterized by permeable sandy to gravelly loam soils with high potential for wind erosion, monsoonal precipitation in summer months and support Sonoran creosote bush scrub and microphyll woodland habitats in dry washes. Elevations range between 25 to 200 feet above mean sea level.

6. Biological Resources

6.1. Vegetation Community Classification

Plant species observed in the Survey Area were identified using Desert Jepson Manual (Baldwin et al. 2002) and the Jepson Flora Project (Jepson eFlora 2019) while vegetation classifications were determined using the United States National Vegetation Classifications Database (USNVC 2019). Vegetation within the Survey Area is located along a thin strip (approximately 10 to 20 feet) just north of the main border patrol road. These vegetation communities extend north from the Survey Area into the greater Yuha Basin. Small areas of disturbed habitat intersect the main patrol road which include off-road vehicle tracks, secondary patrol roads, and vehicle turn around areas.

Vegetation within the Survey Area consists of both native and non-native vegetation communities as follows: Disturbed Habitat, *Brassica tournefortii* - *Malcolmia africana* Ruderal Desert Forbs Alliance, *Chorizanthe rigida* - *Geraea canescens* Desert Pavement, *Larrea tridentata* - *Ambrosia dumosa* Shrubland, *Larrea tridentata* - *Ambrosia dumosa* - *Pleuraphis rigida* Desert Shrubland, *Larrea tridentata* - *Atriplex polycarpa* Desert Shrubland, *Larrea tridentata* - *Fouquieria splendens* Upper Bajada & Rock Outcrop Desert Scrub Alliance, and *Parkinsonia florida* - *Olneya tesota* Desert Wash Scrub Alliance.

6.1.1. Vegetation Community Descriptions

Disturbed Habitat

This vegetation classification covers the majority of the Survey Area and includes the main patrol road along the border. This vegetation class is dominated by bare ground with low cover of ruderal herbaceous plant species. These areas are routinely graded and maintained as part of CBP's road maintenance efforts.

Brassica tournefortii - *Malcolmia africana* Ruderal Desert Forbs Alliance (A4166)

This alliance type occurs in two small patches north of the main patrol road at the eastern end of the Survey Area. The ruderal forbland is dominated by Sahara mustard (*Brassica tournefortii*) with scattered annual plant species including Plicate tiquilia (*Tiquilia plicata*), Booth's evening primrose (*Eremothera boothii*), white bur-sage (*Ambrosia dumosa*), and popcorn flower (*Cryptantha* sp.).

Chorizanthe rigida - Geraea canescens Desert Pavement (CEGL009686)

This desert pavement association is found throughout the middle and eastern portion of the Survey Area and is characterized by rocky substrate derived from a diversity in parent material on southwestern aspects. Vegetative cover is sparse across this association with a dominance of low growing annual plant species including rigid spineflower (*Chorizanthe rigida*), desert sunflower (*Geraea canescens*), *Cryptantha*, Booth's evening primrose and scattered creosote bush (*Larrea tridentata*) throughout.

Larrea tridentata - Ambrosia dumosa Shrubland (CEGL002954)

This shrubland type is characterized by a codominance of creosote bush and white bur-sage and is located throughout the Survey Area. Annual plant species observed include *Cryptantha*, desert trumpet (*Eriogonum inflatum*), Booth's evening primrose, and Mediterranean schismus (*Schismus barbatus*). At the western terminus of the Survey Area this shrubland included sparse cover of white rhatany (*Krameria bicolor*) and brittlebush (*Encelia farinosa*). Sparse cover of honey mesquite (*Prosopis glandulosa* var. *torreyana*) was present in larger drainage features.

Larrea tridentata - Ambrosia dumosa - Hilaria rigida Desert Shrubland (CEGL005764)

This shrubland type is similar in stature to the above *Larrea tridentata* – *Ambrosia dumosa* Shrubland with the addition of big galleta (*Hilaria rigida*) as an additional codominant. This shrubland type was found in the middle portion of the Survey Area within the bed of drainage features typically with sandy and fine textured soils. Other plant species observed included rhatany as well as large undisturbed areas covered by cryptobiotic crusts.

Larrea tridentata - Atriplex polycarpa Desert Shrubland (CEGL005765)

This shrubland type is found along the eastern extend of the Survey Area and is characterized by dense shrub cover of creosote bush and many-fruit saltbush (*Atriplex polycarpa*). Associated annual plant species present in low cover include *Cryptantha*, Mediterranean schismus, and desert plantain (*Plantago patagonica*).

Larrea tridentata - Fouquieria splendens Upper Bajada & Rock Outcrop Desert Scrub Alliance (A3278)

This alliance occurs from the middle to the western extent of the Survey Area and includes creosote bush and ocotillo (*Fouquieria splendens* ssp. *splendens*) as the dominant plant species. Associated plant species include sparse cover of white rhatany, white bur-sage and teddy-bear cholla (*Cylindropuntia bigelovii*).

Parkinsonia florida - Olneya tesota Desert Wash Scrub Alliance (A0588)

This tree dominated alliance was observed in two areas, one at the eastern terminus of the Survey Area and the second within the western portion of the Survey Area. This alliance is characterized by a codominance of blue paloverde (*Parkinsonia florida*) and ironwood (*Olneya tesota*) tree and is typically found within sandy substrates associated with bottomlands and drainages across the Survey Area. Associated annual species included common Mediterranean grass, popcorn flower, and wooly plantain.

6.2. Non-native Species

NatureServe defines a non-native species as “those present in a specified region only as a direct or indirect result of human activity. Other terms that are often used as synonyms for non- native include alien, exotic, introduced, adventive, non-indigenous, and non-aboriginal.” From a conservation perspective, non-native plant species may be very harmful, as many, though not all, non-native species negatively affect native species by outcompeting or hybridizing with them and by modifying the local ecosystem processes they depend on (NatureServe 2019b). The California Invasive Plant Council (Cal-IPC) ranks non-native plant species as having High, Moderate, or Limited ecological impacts:

High. These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate. These species have substantial and apparent—but generally not severe— ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited. These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

This ranking is based on 13 criteria divided into three main categories: the ecological impacts of a species, the species’ ability to invade natural vegetation, and the species’ current ecological amplitude and extent of invasion. Except for a couple small patches of *Brassica tournefortii* - *Malcolmia africana* Ruderal Desert Forbs Alliance on the east end of the Survey Area the vegetative land cover types discussed in Section 6.1.1 are native plant species. Two non-native species, Sahara mustard and Mediterranean schismus are Cal-IPC listed plant species. Sahara mustard has a Cal-IPC ranking of High, and Mediterranean schismus is ranked Limited.

6.3. Special-Status Plants

Calflora lists 1,169 plant species documented within Imperial County (Calflora 2019). Of these, 949 are native to California and 220 species are nonnative. A total of 27 species of plants were documented within the Survey Area during site visits (Appendix F), including 24 native and three non-native species. No special-status plants, as defined in Section 3.0, were observed within the Survey Area during survey efforts but a total of 12 special-status plant species have been documented to occur within one mile of the Survey Area, within the Coyote Wells, Yuha Basin and Mount Signal U.S. Geological Survey 7.5-minute quadrangles.

There are eight special-status species found to have high potential to occur within the Survey Area; roughstalk witch grass (*Panicum hirticaule* ssp. *hirticaule*), brown turbans (*Malperia tenuis*), Abrams’ spurge (*Euphorbia abramsiana*), Harwood’s milkvetch (*Astragalus insularis* var. *harwoodii*), pink fairyduster (*Calliandra eriophylla*), hairy stickleaf (*Mentzelia hirsutissima*), Baja California ipomopsis (*Ipomopsis effusa*), and slender cottonheads (*Nemacaulis denudata* var. *gracilis*). An additional two special-status species have a moderate potential to occur within the Survey Area; dwarf germander (*Teucrium cubense* ssp. *depressum*) and Parish’s desert thorn (*Lycium parishii*). All special-status species listed above have the potential to occur in the Survey Area due to suitable soil, topographical, and/or vegetation

communities observed during surveys. The remaining two special-status species with potential to occur were considered unlikely due to a lack of suitable habitat conditions.

All special-status plant species with a moderate to high potential to occur in the Survey Area are discussed in greater detail in Appendix B.

6.4. Special-Status Wildlife

The vegetation within the Survey Area supports a diverse wildlife community. The majority of the Survey Area is disturbed and consists of a graded, packed and maintained patrol road and existing vehicle barrier (primarily Normandy Style vehicle barriers). Disturbed native vegetative land cover is used by both native and migratory bird species. Appendix G lists the wildlife observed during the survey effort. Appendix E lists all special-status wildlife, as defined in Section 3.0, with the potential to occur within one mile of the Survey Area. Detailed accounts of all federally listed species and special-status species observed present or with a moderate to high potential to occur within one mile of the Survey Area are provided in Appendix C.

6.4.1. Reptiles

No federally listed reptile species were documented in the Survey Area during the survey effort, but one special-status reptile, the flat-tailed horned lizard (*Phrynosoma macallii*), was observed to be present. Flat-tailed horned lizard scat and tracks were observed during general biological surveys within the Survey Area on July 11, 2019. The flat-tailed horned lizard is a CDFW Species of Special Concern and a BLM Sensitive Species and management of the species is governed by the Flat-tailed Horned Lizard Interagency Coordinating Committee set up under a 1997 conservation agreement. The conservation agreement is in lieu of listing the species as endangered. The Survey Area is within the Yuha Desert Management Area as identified in the Flat-tailed Horned Lizard Rangelwide Management Strategy (Flat-tailed Horned Lizard Interagency Coordinating Committee 2003).

In addition to the flat-tailed horned lizard, two additional special-status reptile species have a high potential to occur in the Survey Area, the Barefoot banded gecko (*Coleonyx switaki switaki*) and Colorado Desert fringe-toed lizard (*Uma notata*). The barefoot banded gecko is listed as threatened by the California ESA, is a CDFW Species of Special Concern, and a BLM Sensitive Species. They inhabit arid rocky areas in the foothills of the Eastern Peninsular Range. They prefer areas with boulders and rock outcrops with sparse vegetation. They spend the daylight hours under rocks or in rock cracks and venture out at night to hunt their insect and arthropod prey. The west end of the Survey Area reaches the eastern edge of the Peninsular Range foothills, and the eastern edge of barefoot banded gecko range. The steep rugged slopes present in this part of the Survey Area are littered with rocks of varying sizes and boulder outcrops, highly suitable for the barefoot banded gecko.

The Colorado Desert fringe-toed lizard (*Uma notata*) is adapted to life in soft shifting desert sands. They require areas of sparse vegetation and fine, wind-blown sands which they use as shelter overnight, avoid excessive desert heat during the day, and to escape predators. Areas of fine sand are a key habitat element for the Colorado Desert fringe-toes lizard, and they possess specific adaptations to deal with the soft media, including fringed toes to aid in movement, a countersunk lower jaw, overlapping eyelids, flaps on their ears and valve-like nostrils and nasal passages to help them burrow and keep the fine sand out. Throughout the Survey Area there are areas where wind-blown sand accumulates, both in the undisturbed areas, and along existing patrol roads. Accumulation of wind-blown sand is such an issue in the Survey Area, that regular road maintenance to remove fine sand deposits are necessary to keep patrol roads accessible. These areas of fine sand accumulation are high-quality habitat for the Colorado Desert fringe-

toed lizard. Suitable habitat and historic observations of this species within 0.5 miles of the Survey Area indicate it is highly likely to occur within the Survey Area.

6.4.2. Birds

No federally listed bird species were observed in the Survey Area; but one CDFW Species of Special Concern, the loggerhead shrike (*Lanius ludovicianus*), was observed during surveys. Burrowing owl (*Athene cunicularia*), prairie falcon (*Falco mexicanus*), and black-tailed gnatcatcher (*Poliophtila melanura*) have a high potential to occur within the Survey Area. Burrowing owl require open desert floor or agricultural field in association with burrow-forming animal species to provide suitable nest burrows. Several historic occurrences have been documented to the northeast of the project (CNDDDB 2019) in former agricultural habitats, Additional occurrences in agricultural fields have been documented within 10 miles of the Survey Area to the northeast (CNDDDB 2019). Historic occurrences from desert scrub habitats have also been documented 8 miles north of the Survey Area (CNDDDB 2019). The Survey Area contains suitable foraging and burrow habitat to support nesting and wintering burrowing owls.

Suitable rocky ledge nesting habitat for prairie falcons is present to the west of the Survey Area in the rugged, boulder-strewn foothills of the Eastern Peninsular Range (CNDDDB 2019). Prairie falcons nesting in this area would likely forage over the Survey Area where suitable native and non-native prey species, including rock pigeon (*Columba livia*), Eurasian collared-dove (*Streptopelia decaocto*), white-winged dove (*Zenaida asiatica*), mourning dove (*Zenaida macroura*) and common ground-dove (*Columbina passerina*), in addition to other avian species, were observed during the survey effort. The ground-burrowing mammals that provide burrow habitat for burrowing owls would also likely be suitable mammalian prey for prairie falcons. Sufficient prey species are present in the Survey Area to support foraging prairie falcons.

The black-tailed gnatcatchers prefer desert habitats including dry washes and other shrub habitats. A number of dry washes or ephemeral streams were documented in the Survey Area during the jurisdictional assessment. These areas were associated with creosote and palo verde dominated vegetation communities, the latter species is also a suitable thorny nesting tree species. Historic occurrences of black-tailed gnatcatchers have been documented 6.5 miles to the north of the Survey Area (CNDDDB 2019). Sufficient nesting and foraging resources are present within and adjacent to the Survey Area to support black-tailed gnatcatchers.

An additional five special-status bird species have a moderate potential to occur in the Survey Area include: golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsoni*), mountain plover (*Charadrius montanus*), and LeConte's thrasher (*Toxostoma lecontei*). Golden eagles in this part of Southern California would likely nest in rock outcrops and cliff faces west of the Survey Area in the foothills of the Eastern Peninsular Range. Golden eagles nesting in this area would forage across the Survey Area in search of suitable prey, including the black-tailed jackrabbit (*Lepus californicus deserticola*), also identified as having a moderate potential to occur in the Survey Area. Golden eagles are known in the region and an active nesting pair is known 13 miles east of the Survey Area at Table Mountain in San Diego County. Ferruginous hawk maybe present during the winter months as individuals or small groups and would prey on small mammals and reptiles in the Survey Area. Swainson's hawk would be present in the Survey Area for only as short time as they migrated through during spring and Fall. During that migration, however, Swainson's hawks may hunt small mammals, reptiles or insects in the Survey Area. Mountain plovers may be present in sandy habitats of the Survey Area during the winter months. This species is not common and most historic observations have occurred in agricultural habitats to the northeast of the Survey Area; however, some documented observations are

only 8 miles from suitable sandy habitat in the Survey Area (CNDDDB 2019). Suitable desert scrub and mesquite vegetation in desert wash habitats are present within and adjacent to the Survey Area to support LeConte's thrasher; however historic observations of this species 3 miles north of the Survey Area are dated from the early 1900's (CNDDDB 2019).

6.4.3. Mammals

No federally listed or special-status mammal species were documented in the Survey Area during the survey effort. One species, the Peninsular bighorn sheep (PBS) (*Ovis canadensis nelsoni*), listed as endangered under the Federal and California Endangered Species Acts (ESA), and as a BLM Sensitive Species, has a high potential to occur in or near the Survey Area. Peninsular bighorn sheep in the Peninsular Range require steep, rugged mountain terrain with sparse vegetation cover to allow for visual detection of predators at a distance. This habitat is present at the extreme western edge of the Survey Area. Peninsular bighorn sheep will also use desert washes, alluvial fans and the desert flats surrounding rugged terrain to forage. The steep, rugged mountain terrain and surrounding desert flats at the west end of the Survey Area are suitable to support the presence of PBS.

Three additional special-status mammals have a high potential to be present in the Survey Area; western mastiff bat (*Eumops perotis californicus*), pocketed free-tailed bat (*Nyctinomops femorosaccus*) and big free-tailed bat (*Nyctinomops macrotis*). The three special-status mammals with a high potential to occur in the Survey Area are all bat species in the family Molossidae, the "free-tailed" bats. All three share some similar life history characteristics that make their presence likely in the Survey Area. All three species can inhabit arid regions and are rock crevice-roosting species. All three species prefer the rugged rocky terrain found in the foothills to the west of the Survey Area for roosting. All three species are swift, high flying bat species that target moths as their principal food source. The open rolling terrain of the Survey Area would suit these species and their hunting style, with a foraging space uncluttered by complex vegetative structure. There is, however, sufficient vegetative growth to support the moth food base preferred by these species. The agricultural landscape east of the project would further support individuals roosting in rugged rocky terrain west of the Survey Area and south of the U.S./Mexico international border. The few documented occurrences of these species in the region come from the agricultural habitats (CNDDDB 2019). One mummified specimen of western mastiff bat was recovered from inside a CBP camera tower monopole approximately .22 miles north of the Survey Area in 2012 (D. Janeke, Biologist, Bio-Studies, personal communication).

An additional 9 special-status mammal species have a moderate potential to occur in the Survey Area, including the pallid bat (*Antrozous pallidus*), pallid San Diego pocket mouse (*Chaetodipus fallax pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), western yellow bat (*Lasiurus xanthinus*), California leaf-nosed bat (*Macrotus californicus*), Yuma myotis (*Myotis yumanensis*), Palm Springs little pocket mouse (*Perognathus longimembris bangsi*), Yuma hispid cotton rat (*Sigmodon hispidus eremicus*), and American badger (*Taxidea taxus*).

Bat species, including pallid bats, Townsend's big-eared bats, California leaf-nosed bats and Yuma myotis all have the potential to roost in the rough rocky terrain west of the Survey Area and forage within the Survey Area. Townsend's big-eared bats and California leaf-nosed bats are more mine and cave roosting species while pallid bats and Yuma myotis tend to favor more rock crevice style roosting habitat. All species have the potential to roost in suitable human-constructed habitats like bridges, culverts or buildings. These roosting habitats can be found to the east or west of the Survey Area, but roosting habitat within the Survey Area is limited to absent. The desert flats, rolling hills and sandy washes of within and adjacent to the Survey area are all suitable foraging habitat for most of these species. The Yuma myotis;

however, prefers to forage over water sources like the irrigation canals found near the east end of the Survey Area. Western yellow bats differ considerably in that they prefer to roost in trees, particularly in the dead palm frond skirts of native and non-native palms. This roosting habitat is found near both ends of the Survey Area in Palm oases and where palms have been planted along agricultural fields as wind breaks. Western yellow bats would also forage around similar agricultural areas, including fields, irrigation canals, and riparian habitats, also found within one mile of the east end of the Survey Area.

Both the pallid San Diego pocket mouse and the Palm Springs little pocket mouse share somewhat similar habitat characteristics. Both species prefer desert scrub type habitats that provide for their seed-based diets, and sandy, friable soils that allow for burrowing. The San Diego Pocket mouse prefers a rockier soils type and is frequently associated with *Yucca* species which were not observed in the Survey Area. Neither species has been documented within a mile of the Survey Area, but both have documented occurrences less than 9 miles away from the Survey Area in vegetation types similar to those present throughout and adjacent to the Survey Area.

Irrigation canals and agricultural fields at the east of the Survey Area have suitable cover and forage to support Yuma hispid cotton rats. There is no suitable habitat further to the east in the Survey Area. Historic observations of Yuma hispid cotton rats have been documented 4.5 miles to the north of the Survey Area along an irrigation canal (CNDDDB 2019). The same irrigation canal flows to within 0.5 miles of the Survey Area, providing suitable habitat to support this species.

American badgers can be found in desert scrub and agricultural habitats that are found within a mile of the Survey Area. A suitable prey base is likely to be present as evidenced by the numerous small mammal burrows observed in and adjacent to the Survey Area. Observations of American badgers 7 miles north of the Survey Area are over 50 years old, but suitable habitat is still present at historic sites and within the Survey Area to support badgers.

6.5. Hydrology

The full jurisdictional assessment and associated figures are found in the *Jurisdictional Assessment for the El Centro Fence Replacement Project* report (Bio-Studies 2020). The U.S. Army Corps of Engineers (USACE) regulates “Waters of the United States” under Section 404 of the Clean Water Act (CWA). Waters of the U.S. are defined in the Code of Federal Regulations (CFR) as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas, as defined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated at a sufficient depth and for a sufficient duration to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as “non-wetland waters” and are often characterized by an ordinary high water mark (OHWM). Non-wetland waters generally include lakes, rivers, drainages, and other open-water habitats. The placement of fill material into Waters of the U.S generally requires an individual or nationwide permit from the USACE under Section 404 of the CWA.

6.5.1. Field Evaluation Summary

A focused evaluation of the wetland and waters indicators within the Survey Area was conducted to determine the presence of “Waters of the United States” other than wetlands potentially subject to USACE jurisdiction under Section 404 of the CWA. Other areas, besides wetlands, subject to USACE jurisdiction include lakes, rivers and drainages (including intermittent and ephemeral drainages). Based on this evaluation, the Survey Area contains approximately 2.69 acres of potentially jurisdictional non-wetland

waters (Table 1). The Survey Area includes one non-wetland water category, ephemeral drainage. Although evidence of hydrology was present throughout the Survey Area, appropriate hydrophytic vegetation or hydric soils essential to qualify an area as a wetland were not observed. Some ephemeral drainages displayed an OHWM and are linked to “navigable waters of the U.S.,” and therefore are potentially jurisdictional under Section 404 of the CWA. Areas that met the criteria for CDFW Section 1602 jurisdiction were identified in the course of field investigations but are not presented in this report.

Table 1. Summary of Potential CWA Section 404 Jurisdictional Features

Potentially Jurisdictional Features	Acres in Survey Area
Non-Wetland Waters	
Ephemeral drainage	2.69
TOTAL	2.69

6.5.2. Non-wetland Waters

The Survey Area contains only non-wetland waters in the category of ephemeral drainages. Forty-nine ephemeral drainages are likely to be considered jurisdictional by the USACE.

Ephemeral Drainage

Ephemeral drainages are episodic channels that convey water flow during and immediately after precipitation events. Across the Survey Area most of these features are shallow bottomed narrow, often braided, channel systems that stretch across alluvial fan and flood plain systems. Within this landscape several larger singular channels exist and were often culverted. Although these features appear larger due to surrounding topography, their single flow channels remained shallow and flows were not considered to be intermittent. The general directionality of all features across the Survey Area run in a north and south direction and bisect the Survey Area. With the rolling topography across the Survey Area features showed flow in both southerly and northerly directions.

In the northern foothills of Mount Signal along the eastern portion of the Survey Area many of the deeply incised stream channels within the Survey Area are associated with previously installed Arizona Crossing concrete pads which cross the main border patrol road. As no water staining or other evidence of flow was apparent during the survey period to define OHWM, the margins of the Arizona crossings were included in the jurisdictional assessment where appropriate. Within the same area of the project culverted stream crossings flowed under the main border patrol road were noted as part of the survey effort. While features north and south of the culverted areas could potentially be considered jurisdictional, portions of culverted features under the roadbed are not considered to be potentially jurisdictional.

6.5.3. Manmade or Relict Features Not Mapped as Potentially Jurisdictional Features

Within the Survey Area there are several features that are either relict features that have no evidence of conveying water or features that convey water and are not considered potentially jurisdictional, such as:

Drainage features occurring across the Survey Area and flow south into Mexico and as a result have no connectivity to navigable waters of the U.S.

- One drainage feature occurring in the eastern portion of the Survey Area flows north into the U.S. from Mexico. This feature is located at the southern edge of the main patrol road ending at the road berm and as a result have no connectivity to waters of the U.S.
- Three drainage features originating in Mexico and flowing north into the U.S. are all part of same overall drainage system. This system quickly turns south and any water conveyance sheet flows across the main patrol road and back into Mexico. These three features are isolated and have no connectivity to waters of the U.S.
- Two features presented OHWM indicators south of the main patrol road under the vehicle barriers with no evidence of OHWM indicators continuing to the north edge of the Survey Area and existing road. These features are not considered to be potentially jurisdictional as they lack connectivity to waters of the U.S.
- One drainage feature at western extent of Project flows north into the Crucifixion Thorn Natural Area, a dry lakebed approximately 3 miles northeast of the Survey Area. There is no evidence of this feature ever being navigable and is an isolated feature lacking connectivity to waters of the U.S. (CWA 2008).
- One concrete V-shaped feature occurs at the eastern terminus of the Survey Area. This feature is approximately eight feet wide and four feet deep and during the time of the survey was filled with windblown sand. This feature is aligned north to south and perpendicular to the intersection of the Westside Main Canal and the All American Canal, which lies to the east. Immediately north of the Survey Area boundary there is a head gate and infrastructure relating to the adjacent canal. This concrete feature serves as an overflow drain to the canal system and is not considered to be potentially jurisdictional.
- Roadside overflow drains occur throughout the rolling terrain of the western half of the Survey Area. Typically, these Best Management Practice (BMP) structures were found at the southern edge of the larger Pinto Wash landform which includes steep cliff terrain just north of the Survey Area. These corrugated metal structures are set into the road berms with concrete and riprap and contain supported corrugated metal down drains which channelize flows from road runoff. The road runoff creates shallow channelized features inside the Survey Area that flow north and downhill into the greater Pinto Wash drainage system. Although there is connectivity to waters of the U.S. via Pinto Wash, these channelized features are man-made and are a result of the anthropogenic disturbance on the landscape and are therefore not considered potentially jurisdictional features.
- Areas where erosional rills have caused head cuts originating from the main patrol road margins within the Survey Area. The road runoff creates shallow to deeply incised channelized features inside the Survey Area. These features are considered a direct result of anthropogenic disturbance and are not considered to be potentially jurisdictional features.
- Earthen swales characterized by low points in gently rolling topography where no indicators of current flow were present. Vegetation and rocky substrates within and adjacent to the features was consistent across the landscape suggesting that these relict features were formed under historic conditions and prior to any alteration of the surrounding topography.

7. Impact Discussion

Impacts below are the maximum possible impacts of the entire Roosevelt reservation based upon the replacing the entire existing vehicle and pedestrian fencing totaling approximately 15 miles with new bollard fence in the Calexico Station AOR within the CBP El Centro Sector. Existing fencing will be replaced with 30-foot high bollard-style fence and will include repairs and improvements to the existing patrol road, installation of a fiberoptic cable for communications, installation of LED lighting and installation of electrical utilities to supply power to the lighting and communications cable.

7.1. Vegetation Communities

The Project would have impacts on native vegetation communities. Replacement of the existing vehicle barrier along the U.S./Mexico international border with 30-foot bollard would cause permanent impact to approximately 25.29 acres of native vegetation communities as described in Table 2 below. Permanent impacts describe the character of the existing vehicle and pedestrian fence alignment, adjacent patrol road, infrastructure related to communications, and installation of LED lighting. Temporary impact areas are defined as areas north of the existing fence and patrol roads used for equipment and materials storage and staging, and laydown yards used to store equipment, materials, and conduct temporary activities in support of the fence replacement project.

Table 2. Vegetation Community Anticipated Impacts

Community Name (USNVC)	Acres in Survey Area
Disturbed habitat	86.02
<i>Chorizanthe rigida</i> - <i>Geraea canescens</i> Desert Pavement	1.95
<i>Larrea tridentata</i> - <i>Ambrosia dumosa</i> Shrubland	15.54
<i>Larrea tridentata</i> - <i>Ambrosia dumosa</i> - <i>Pleuraphis rigida</i> Desert Shrubland	0.94
<i>Larrea tridentata</i> - <i>Atriplex polycarpa</i> Desert Shrubland	0.13
<i>Larrea tridentata</i> - <i>Fouquieria splendens</i> Upper Bajada & Rock Outcrop Desert Scrub Alliance	5.35
<i>Parkinsonia florida</i> - <i>Olneya tesota</i> Desert Wash Scrub Alliance	1.19
<i>Brassica tournefortii</i> - <i>Malcolmia africana</i> Ruderal Desert Forbs Alliance	0.19
TOTAL	111.31

7.2. Special-Status Plant Species

Twelve special-status plant species have a moderate to high potential to occur in previously undisturbed areas within the Survey Area. Therefore, direct negative impacts to special-status plant species within the Survey Area may occur as a result of fence replacement activities. Special-status plant species would be impacted through direct loss of individuals. Adverse impacts to special-status plant species found within the Survey Area could be mitigated by avoidance with guidance by a qualified biological monitor. Best management practices would be implemented to minimize potential impacts to special-status plant species.

7.3. Special-Status Wildlife Species

The majority of wildlife likely to be found within the Survey Area are common and widespread throughout the region. Mobile wildlife such as birds and larger mammals would likely move away from the fence replacement activities toward nearby areas of similar habitat, while smaller, slow, or sedentary species such as invertebrates, reptiles, and smaller mammals could potentially be impacted during construction. Therefore, direct negative impacts to wildlife within the Survey Area may occur. However, because construction would be temporary and temporarily impacted native habitat would be restored, this project is unlikely to result in any long-term or significant decreases for most wildlife populations in the region. Migratory birds could be impacted through direct loss of habitat, including foraging, roosting, nesting, and escape cover. Adverse impacts to nesting birds found within the Project footprint could be mitigated by avoidance by a qualified biologist. Best management practices would be implemented to minimize potential impacts to special-status wildlife species.

7.4. Critical Habitat

Critical habitat has been designated for one species in the region, Peninsular bighorn sheep (Peninsular Range distinct population segment, PBS), but it does not overlap the Survey Area. At the closest approach, PBS critical habitat is present 4.23 miles to the west of the Survey Area. Suitable vegetation and topography for PBS does occur at the western end of the Survey Area and extends to the areas of PBS critical habitat, including open desert scrub vegetation and rugged mountainous terrain. No PBS critical habitat would be impacted as a result of fence replacement activities.

7.5. Hydrology

Forty-nine potentially jurisdictional ephemeral drainages are identified as waters of the U.S. No wetland features occur within the Project's Survey Area. The non-wetland waters would be avoided to the extent feasible and impact minimization measures, as listed in Section 8.1, would be implemented. In areas that cannot otherwise be avoided, some waters of the U.S. would be impacted by the planned Project due to the proposed fence replacement activities within the Survey Area. This disturbance would result from road improvements to the existing vehicle and pedestrian fence alignment, adjacent patrol road, infrastructure related to communications, and installation of LED lighting across the Survey Area. Therefore, the Project would result in both permanent and temporary impacts to waters of the U.S. as described in Table 3. Based on the results of a final impact assessment and availability of funds, non-wetland waters would be restored as near to pre-construction conditions as possible (revegetated with appropriate native species) and permanent impacts would be offset in a manner consistent with regional standards.

Table 3. Summary of Potential CWA Section 404 Jurisdictional Features

Potentially Jurisdictional Features	Acres in Survey Area
Non-Wetland Waters	
Ephemeral drainage	2.69
TOTAL	2.69

8. Best Management Practices and Mitigation

Impacts would be minimized through implementation of appropriate BMPs for the protection of these species as well as for general plants, wildlife, and habitats. Temporarily impacted areas would be

revegetated with native plants or seeds and are expected to function again as suitable for Flat-tailed horned lizard habitat after restoration is complete. Impacts to jurisdictional waters would also be mitigated for appropriately. The scope and extent of any mitigation would be based on a final assessment of impacts after construction is completed. To reduce the potential for impacts to sensitive communities and special-status species, the following general BMPs are recommended for implementation. Implementation of these general BMPs, in combination with the species and habitat specific measures provided in the subsequent sections, would reduce construction related impacts.

It is CBP's policy to reduce impacts through the sequence of avoidance, minimization, and mitigation. Best management practices vary based on location and resource type. CBP may also implement mitigation measures. The scope or extent of CBP's mitigation would be based on the actual impacts from the Project and available funding. Project impacts would be documented during construction and assessed through monitoring after Project construction has been completed. CBP's assessment of mitigation would be based on, among other things, feedback from environmental monitors and the final construction footprint.

No areas within the vicinity of the project have yet to be identified as potential mitigation for this project. Once the final impacts have been assessed a mitigation plan addressing the specific location and methods for mitigation would be prepared. Mitigation can be achieved either on site, or offsite at mitigation bank or an appropriate location for mitigation.

8.1. General Design and Storm Water Pollution Prevention Plan (SWPPP) BMPs

1. The construction workforce would be trained to identify and avoid any sensitive areas or resources. Sensitive areas would be flagged as appropriate (i.e., where they are in the vicinity of potential construction activity), and a biological monitor would be consulted prior to working in sensitive areas to minimize the potential for accidental disturbance from construction equipment and crews.
2. Construction area boundaries would be clearly marked throughout the entire project with snow fencing or something similar.
3. When feasible, construction activities shall avoid impacting vegetation, but when necessary shall implement drive and crush vegetation rather than clearing or grubbing. Construction equipment would drive over and crush native plants to minimize impacts to the roots of desert shrubs. Drive and crush is expected to reduce the recovery time of vegetation within the temporary construction areas.
4. At the end of each workday, construction contractors shall inspect all potential wildlife pitfalls (e.g., trenches, bores, other excavations) for wildlife and remove wildlife as necessary. If the potential pitfalls would not be filled then construction crew would build slopes within the excavation (3:1 slope) to provide wildlife escape ramps or would ensure that the construction crew completely and securely covers when work isn't being done (at night) at the excavation to prevent wildlife entry.
5. The construction crews would provide closed lid containers. Trash and food-related waste should be placed in closed lid containers to ensure that workers do not feed or attract wildlife. The contractor would promote a culture of a clean worksite without trash or debris that wildlife may attempt to eat or use as cover.
6. Except when not feasible due to physical or safety constraints, all Project vehicle movement would be restricted to existing access roads and access roads constructed as a part of the Project and determined and marked by the project proponent in advance of construction. The biological

monitor would be notified and consulted prior to any travel or construction off existing access roads including new access roads.

7. Any night lighting during construction and operation would be selectively placed, shielded, and directed away from all areas of native habitat to the maximum extent practicable; and all unnecessary lighting should be turned off at night to limit attracting migratory birds.
8. Noise-reduction devices (e.g., mufflers) should be maintained in good working order on vehicles and construction equipment. Generators would have baffle boxes, mufflers, or other noise abatement capabilities. Blasting mats would be used to minimize noise and debris.
9. The construction contractor shall actively control dust thorough out all construction and staging areas.
10. Dust abatement techniques should be used on unpaved, unvegetated surfaces to minimize airborne dust; and erosion and fugitive dust control measures would be inspected and maintained regularly. Keep water trucks running for dust control.
11. Restrict construction vehicle speeds to 25 miles per hour on unpaved roads.
12. At the completion of the Project, all construction materials would be removed from the site.
13. Spoils shall be stockpiled in disturbed areas lacking native vegetation or where habitat quality is poor as identified by the biological monitor. All stockpiles would have erosion control around them except while actively being used
14. To the extent possible, disturbance of shrubs and surface soils due to stockpiling shall be minimized. All disturbances, vehicles, and equipment shall be confined to the flagged areas
15. Design measures such as straw waddles, silt fencing, aggregate materials, wetting compounds, and revegetation of native plant species would be installed properly and implemented to decrease erosion and sedimentation.
16. Review the project SWPPP, make a checklist for the entire Survey Area, and provide the checklist to the USACE of engineers, the biological monitor, and the contractor's erosion control contractor for immediate implementation.
17. Ensure the concrete washouts are emptied regularly.
18. Consistently use drip pans at night and under parked equipment.
19. No re-fueling within 100 feet of dry washes
20. Properly install erosion and sediment control BMPs to protect drainages and wetlands.
21. Place old fence panels in previously disturbed areas, in designated laydown yards, or dispose of them immediately.
22. Gravel or topsoil would be obtained from developed or previously used sources. Project design and engineering practices would be implemented to mitigate geologic limitations to site development.
23. Concrete would not be of disposed of except in washout basin that can be removed and never if the basin is more than 75 percent full.

24. All fuels, waste oils, and solvents would be collected and stored in tanks or drums within a secondary containment system. Pumps, hoses, tanks, and other water storage devices would be cleaned and disinfected.
25. Any spill of reportable quantities would be contained immediately within an earthen dike, and the application of an absorbent (e.g., granular, pillow, sock, etc.) would be used to absorb and contain the spill.
26. A Spill Prevention, Control, and Countermeasures Plan would be in place prior to the start of operations, and all personnel would be briefed on this plan.
27. All equipment maintenance, laydown, and dispensing of fuel, oil, or any other such activities would occur in the staging area identified prior to construction starting. The designated staging area would be located in such a manner as to prevent runoff from entering dry washes and/or waters of the United States. All used oil and solvents would be recycled if practicable. All non-recyclable hazardous and regulated wastes would be handled consistent with U.S. Environmental Protection Agency standards.

The following sections describe measures that may be implemented to reduce or eliminate potential adverse impacts on specific aspects of the human and natural environment. Many of these measures have been incorporated by CBP as standard operating procedures based on past projects. Below is a summary of BMPs for each resource category that would be potentially affected

8.2. Recommended Biological Resource BMPs

1. All ground disturbing activities such as crushing, clearing and grubbing, shall be conducted during the non-breeding season (August 15 - February 15). If impacting vegetation is necessary during the breeding season, then the biological monitor would provide avian nesting survey no more than 5 days prior to the clearing of the vegetation.
2. To avoid impacts to nesting birds during the nesting season (generally between February 15 and August 15). Use opaque coverings and/or fill ends with concrete for all open pylons when stored overnight and/or longer without being actively used for construction activities.
3. Fence foundation to be flush or at a ground level to allow for unimpeded movement of small herpetofauna species (e.g. Flat-tailed Horned Lizard, *Phrynosoma mcallii*; FTHL).
4. Identify where the Project needs to go outside the 60-foot project corridor before any impacts and have a biological monitor review and survey the area prior to conducting work activities.
5. All-natural materials (i.e., straw bales and/or fiber rolls) should be reviewed by biological monitors to assess if they are weed free before being brought on site.
6. Invasive plants that appear on the Project site would be removed.
7. Construction equipment would be cleaned prior to entering the site and starting work to minimize spread of non-native species.
8. Removal of trees and brush in habitats of federally listed species would be limited to the smallest amount needed to meet the objectives of the project.
9. Special-status species and their habitats would be avoided whenever feasible, and when not feasible the individuals would be transplanted, relocated, or would be given time to move/fledge on their own.

10. If federally protected species are encountered, construction would stop until the biological monitor can safely remove the individual or it moves away on its own.

8.3. Best Management Practices for Sensitive Species

8.3.1. Flat-tailed Horned Lizard

Habitat for FTHL occurs throughout the entire project alignment with California Natural Diversity Database (CNDDB) occurrences mapped within the Survey Area (CNDDB 2019).

1. Where feasible and desirable, in the judgment of CBP, newly created access routes shall be restricted by constructing barricades, erecting fences with locked gates at road intersections, and/or by posting signs. In these cases, the project proponent shall maintain, including monitoring, all control structures and facilities for the life of the project.
2. A biological monitor shall be present during active ground surface disturbance and new vegetation clearing areas throughout the workday for the life of the project, except where the project is completely fenced and cleared of FTHLs by a biologist.
3. All workers on the construction site would attend a worker training that would address FTHL and BMPs.
4. All workers would check beneath their vehicles and tires for FTHL before driving the vehicles.
5. All sites (e.g., open fence trenches, holes, or other deep excavations) shall be inspected for the presence of FTHLs prior to backfilling.
6. Sites of permanent or long-term (greater than one year) projects in Management Areas where continuing activities are planned and where FTHL mortality could occur, may be enclosed with FTHL barrier fencing to prevent lizards from wandering onto the project site where they may be subject to collection, death, or injury. Barrier fencing should be in accordance with the standards outlined in FTHL Management Plan.
7. Construction of new paved roads shall include a lizard barrier fence on each side of the road that is exposed to occupied FTHL habitat. Exceptions may occur in accordance with the following evaluation, to be applied separately to each side of the road. This prescription may also be applied to canals or other fragmenting projects (Flat-tailed Horned Lizard Interagency Coordinating Committee. 2003).
8. All fence section would have their bases at ground level so that no impediments to wildlife would be constructed.

8.3.2. Barefoot Banded Gecko

Nearest occurrences noted from In-ko-pah Gorge USGS 7.5-minute Quadrangle. Suitable habitat components exist along the western terminus of the Survey Area within the rocky substrate at the base of the Jacumba Mountains. Found only in areas of massive rock and rock outcrops, with preference to deep rock cracks and crevices. Habitats include Mojavean and Sonoran Desert scrub.

1. Prior to clearing of rocks or vegetation preconstruction surveys shall be conducted in suitable habitat by a qualified biologist following the Survey Protocol for the Barefoot Banded Gecko (*Coleonyx switaki*; Crayon 2010).

2. Biological monitors would be required full-time during ground disturbing activities occurring within mapped barefoot banded gecko habitat (This BMP would be in place for the last 150 feet from the western end of the project within the rocky substrate).

8.3.3. Burrowing Owl

Nearest occurrence: Known populations exist along agricultural fields and drainages throughout Calexico, California. Suitable habitat occurs across Survey Area within creosote bush scrub, washes, and along drainage

1. Avoid disturbing occupied burrows during the nesting period, from 15 February through 31 August.
2. Avoid impacting burrows occupied during the non-breeding season by migratory or non-migratory resident burrowing owls. Burrow areas would be flagged with a 250-foot buffer.
3. If construction activities must take place within an active burrow buffer during BUOW nesting period active relocation services may be contacted to avoid impacts to this species.

8.3.4. Peninsular Bighorn Sheep

Nearest occurrence: Peninsular Bighorn Sheep (PBS) are known to occur in the extensive rocky habitat of the Jacumba mountains that occurs at the immediate western end of the Project. Critical habitat for this species is mapped approximately 4.23 miles from the western terminus of the project (USFWS 2019).

1. If PBS are observed near the Survey Area all work would stop within 1,000-feet of the sheep until it/they have moved beyond 1000 feet of the work area to avoid impacts to the species. To the extent feasible a biological monitor would be present to observe work activities when they occur within PBS essential habitat.

8.4. Federal Migratory Bird Treaty Act

To prevent impacts to avian species covered under the MBTA, clearing and grubbing should take place in fall and winter if possible, to avoid impacts to nesting birds. If work cannot be avoided during the breeding season (February 15 to September 15), one week prior to starting work a biologist would survey for nesting birds and identify any nests. An appropriate buffer for avoidance would be established around any nesting birds until the young have fledged or the nest is no longer being used.

1. If active bird nests are found within the Survey Area, buffers where project related activities may not occur would be implemented as follows:
 - a. Raptor nests - 300-foot buffer.
 - b. Burrowing owl burrow - 250-foot buffer.
 - c. Sensitive bird species (Appendix E) - 100-foot buffer.
 - d. Migratory birds - 25-foot buffer.

8.5. Protection of Special-Status Plants

Special-status plant species surveys were conducted between July 9 to 12, 2019 throughout the Survey Area. No special-status plants species were observed, but 10 species have a moderate to high potential to occur, eight of which are annual species which may have gone undetected during Summer surveys (Appendix D). To prevent impacts to these species they would be marked if observed for avoidance; plants that cannot be avoided would be salvaged if possible (either whole plants or soils), depending on factors

such as species and phenology. If plants cannot be avoided or salvaged, the extent and location of the population would be documented and provided to CBP.

9. List of Preparers

Dustin Janeke

Senior Biologist

Years of Experience: 19

Lindsay Willrick

Senior Biologist

Years of Experience: 12

Rod Dossey

Senior Biologist

Years of Experience: 25

Brent Kober

GIS Manager

Years of Experience: 22

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Appendix A:
Figures

Figure 1: Project Overview Map

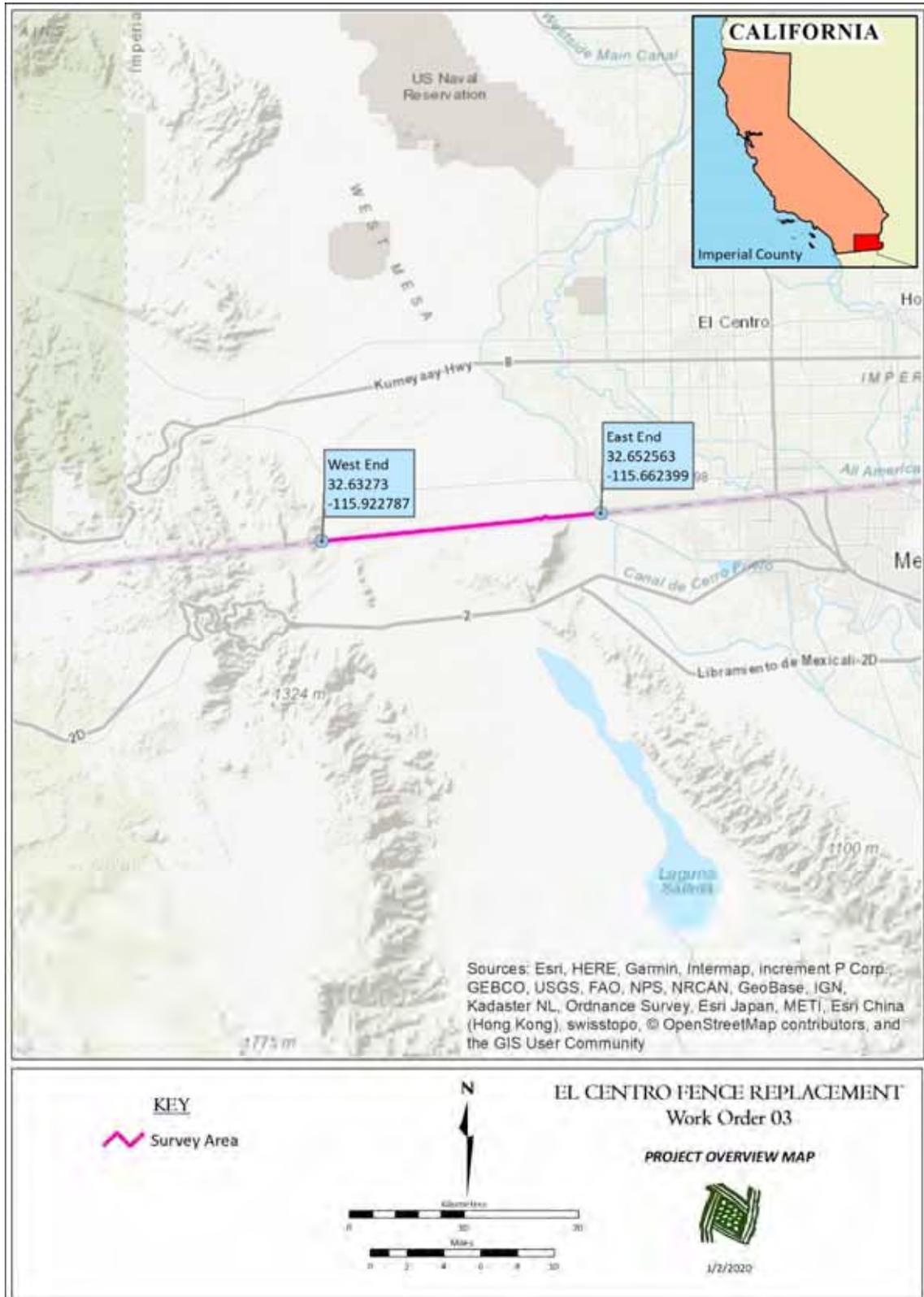


Figure 1

Figure 2: Project Location Map

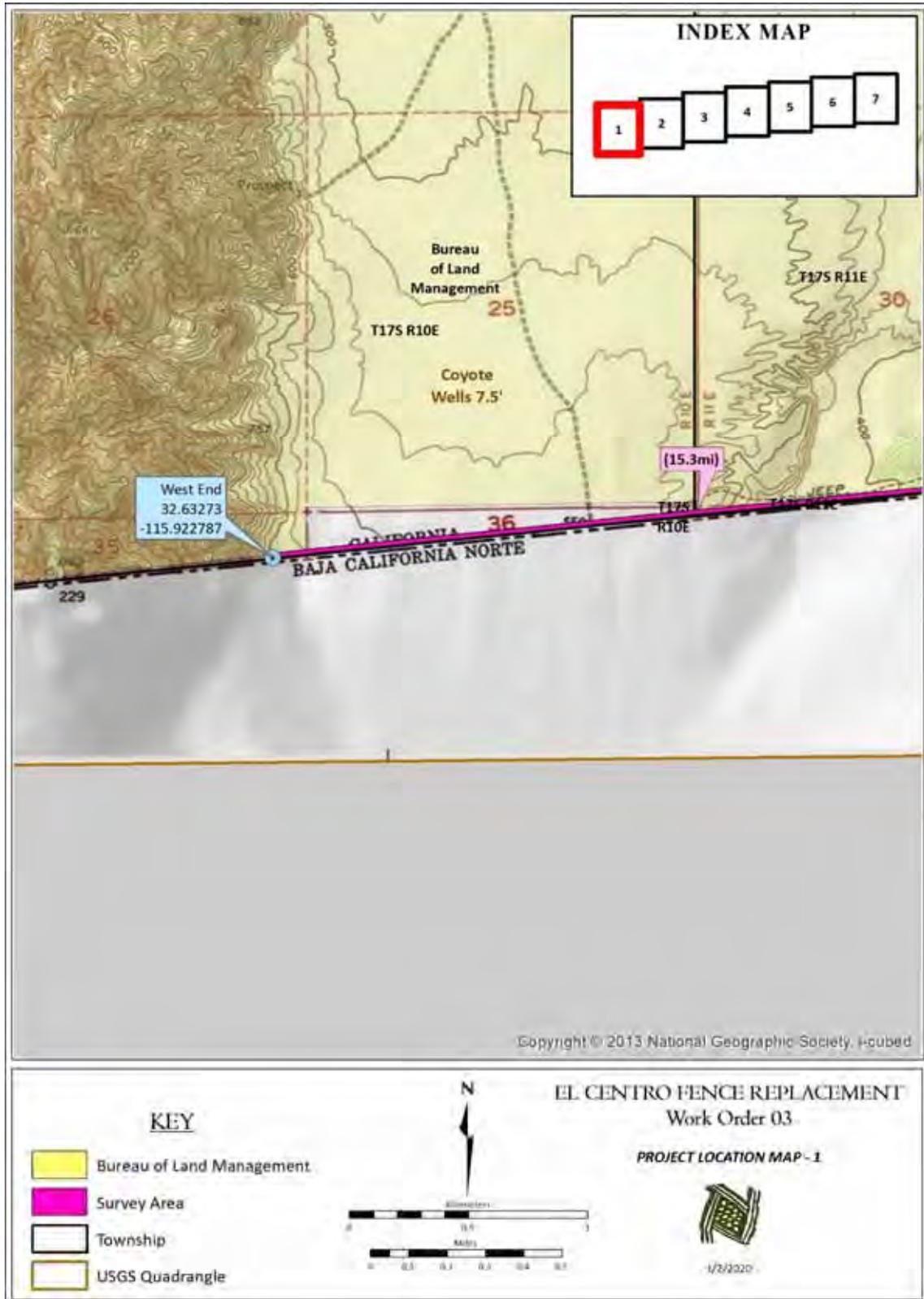


Figure 2

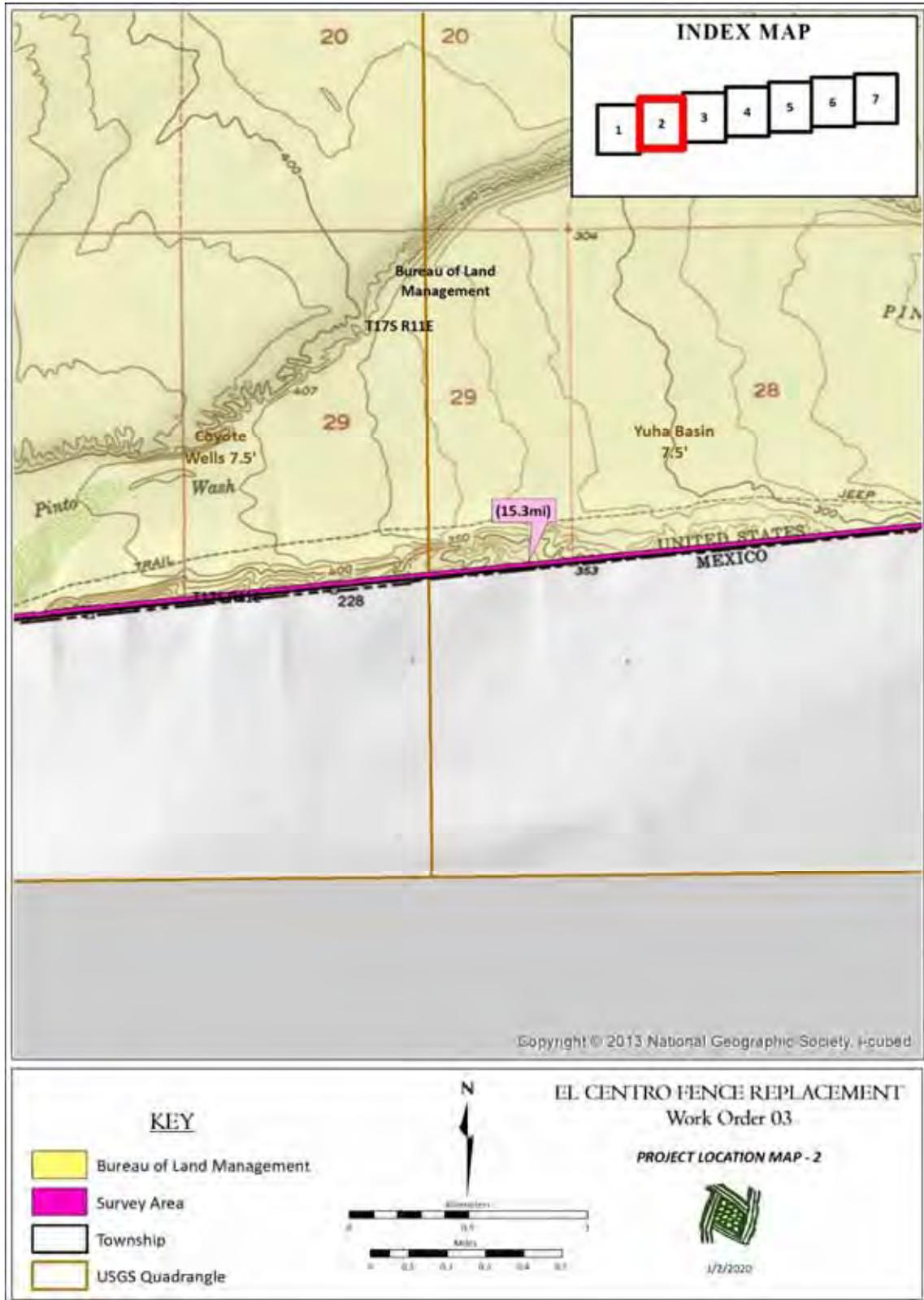


Figure 2

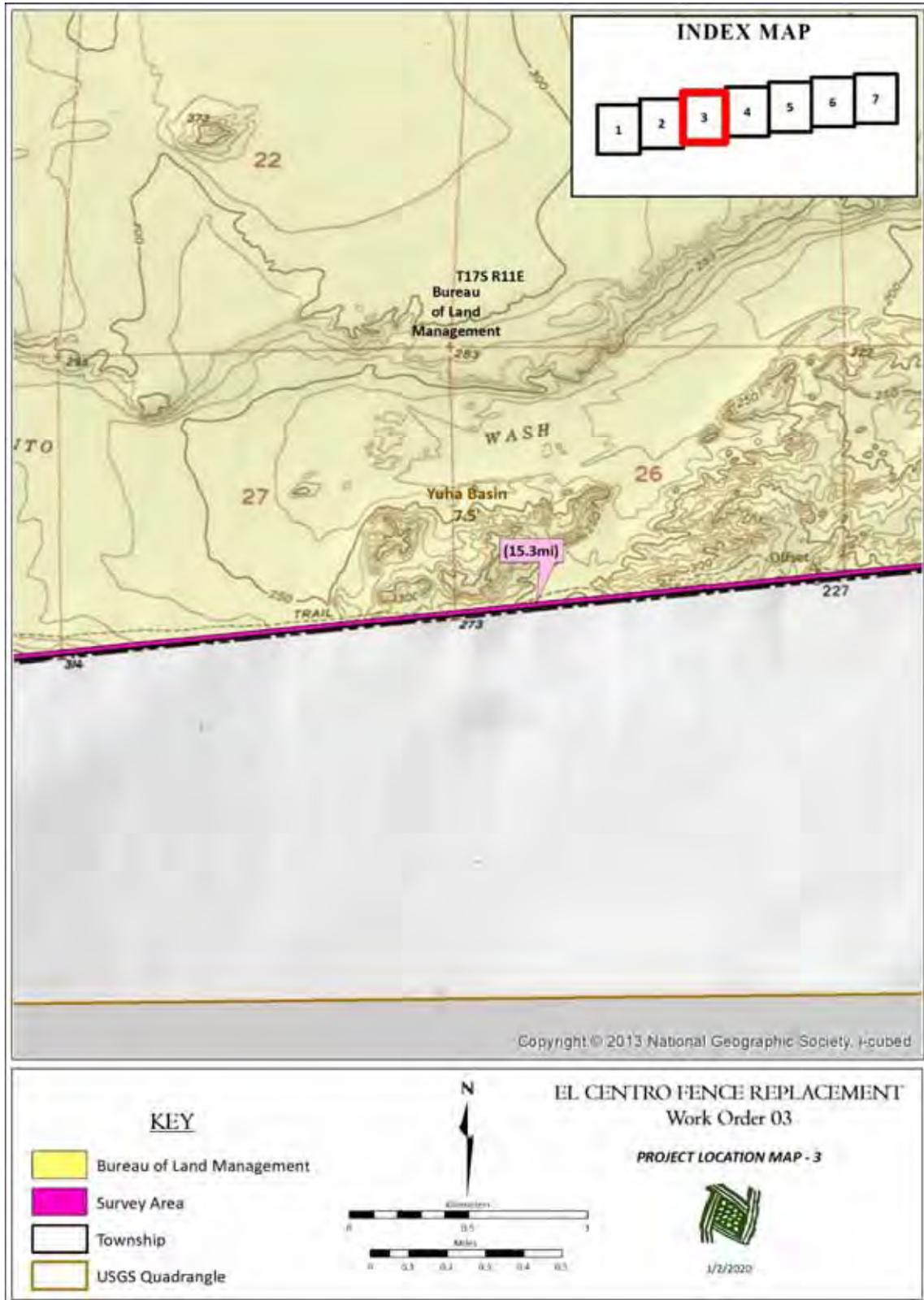


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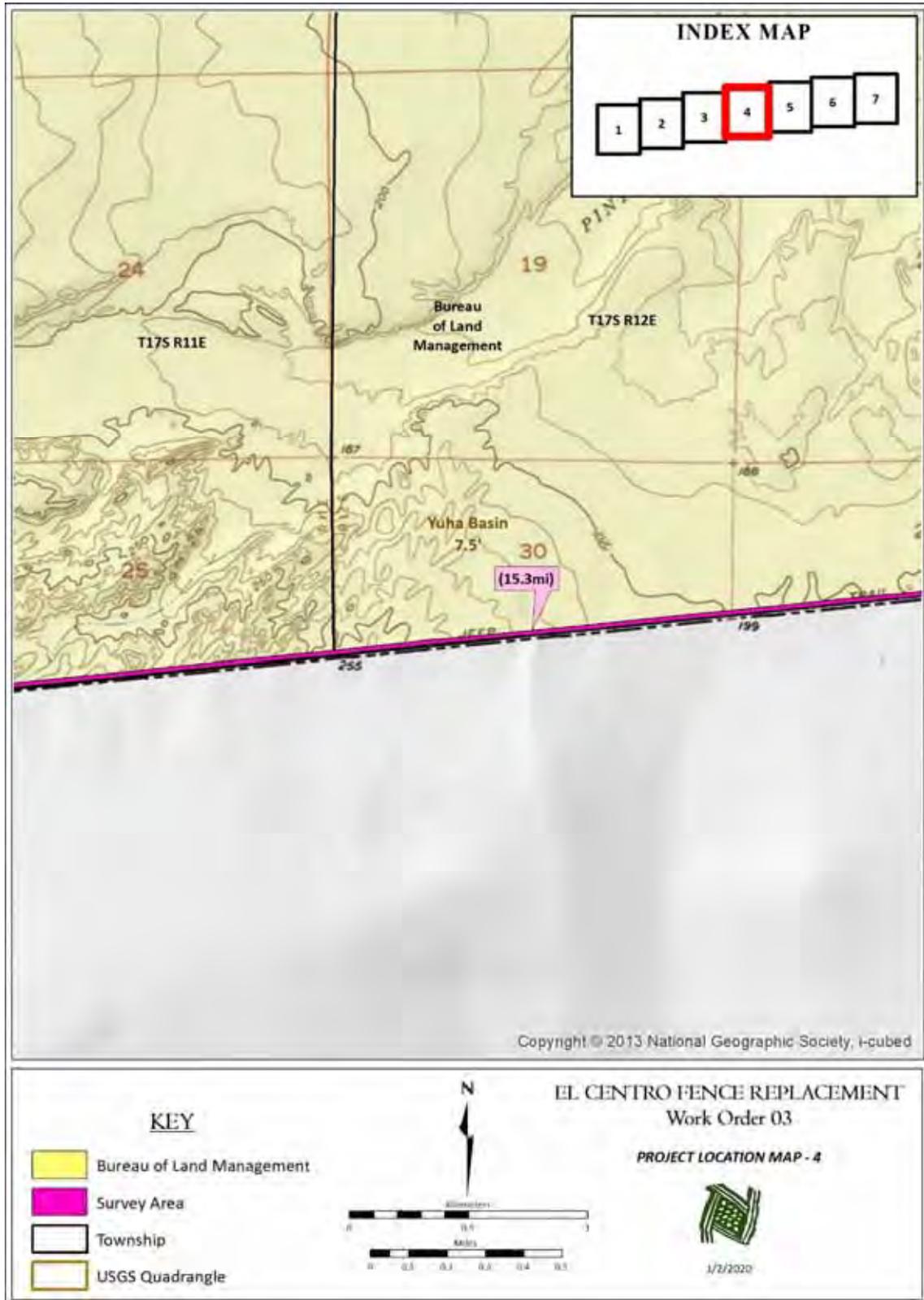


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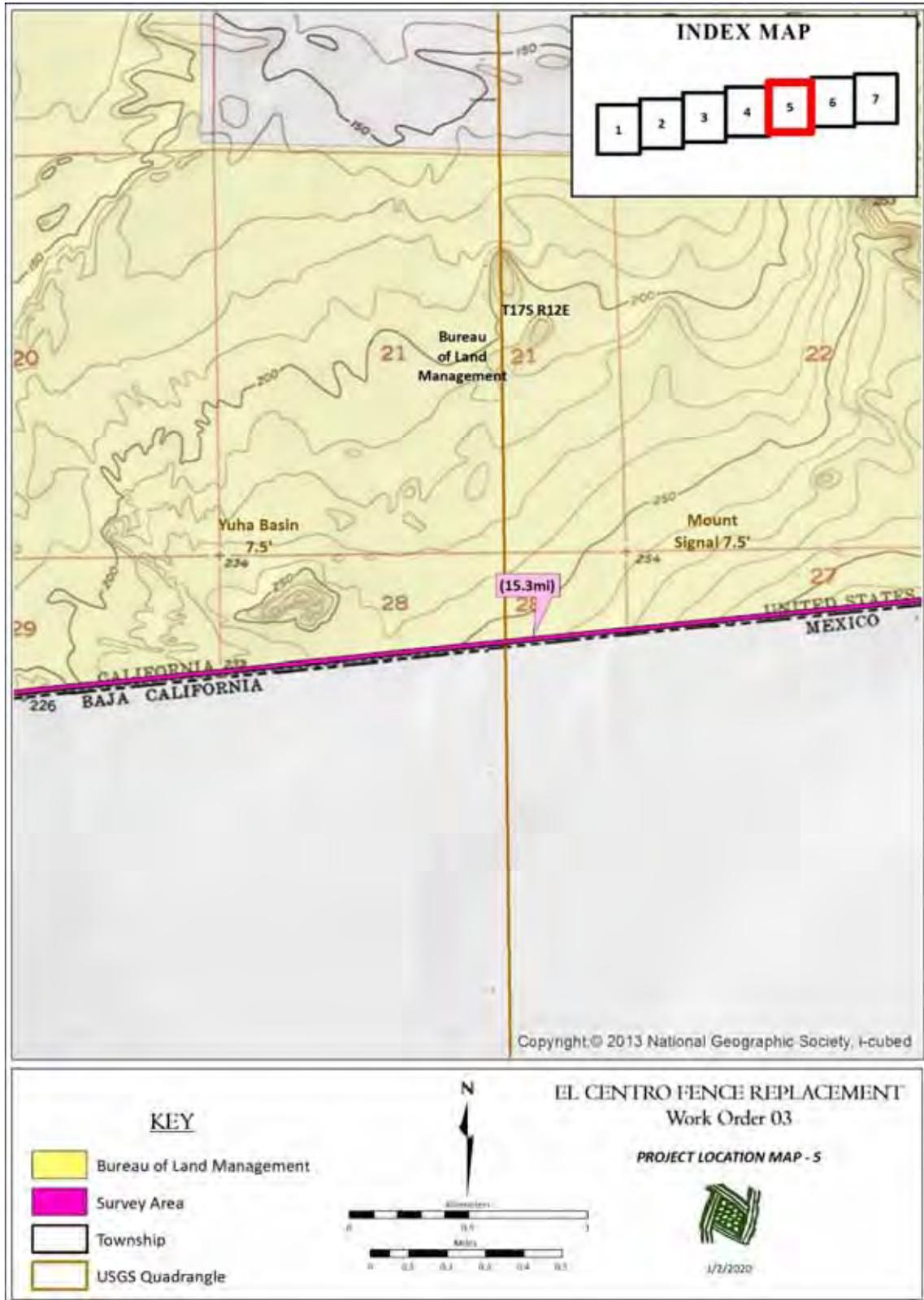


Figure 2



Figure 2



Figure 2

Figure 3: Critical Habitat Map

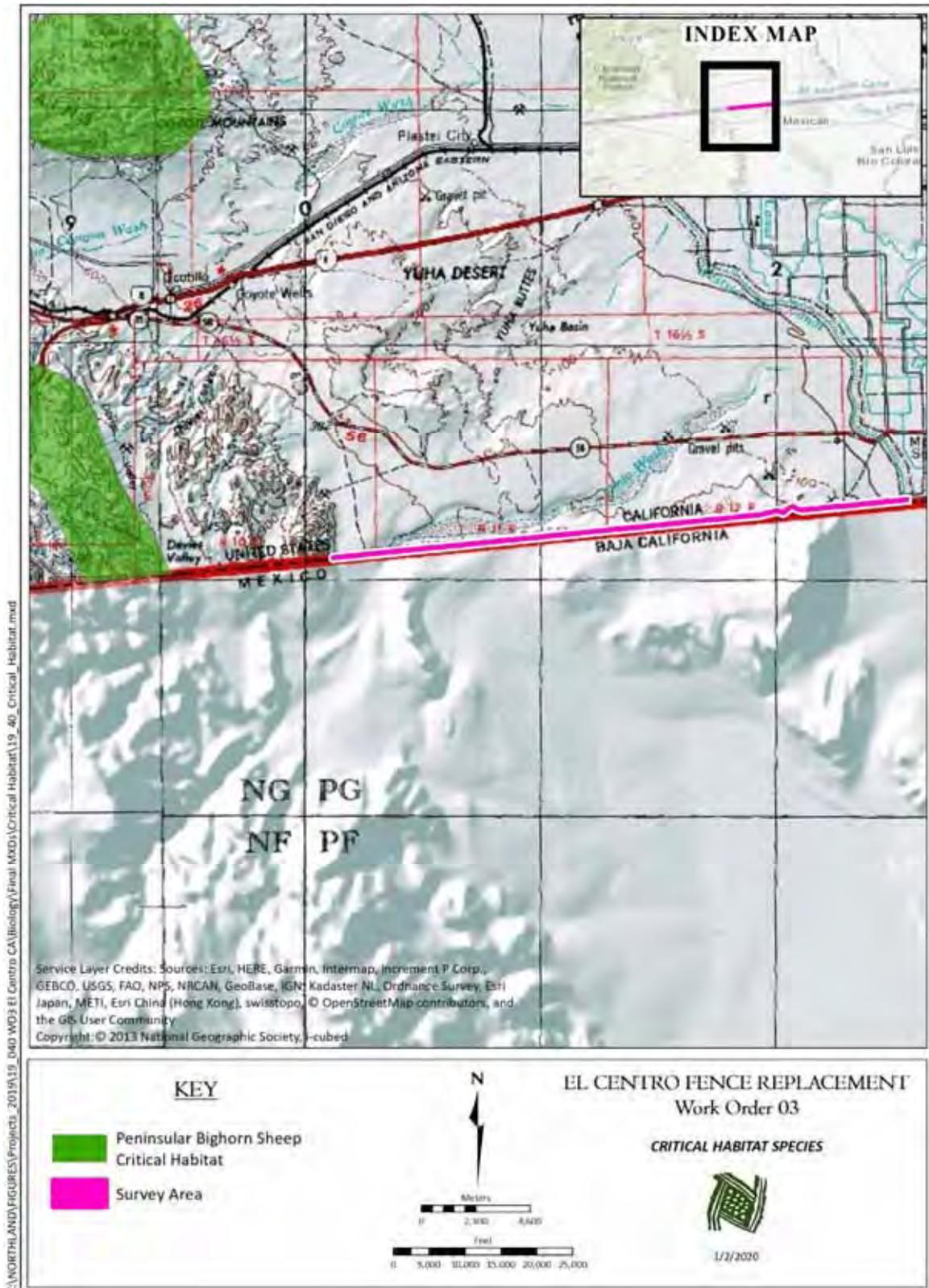
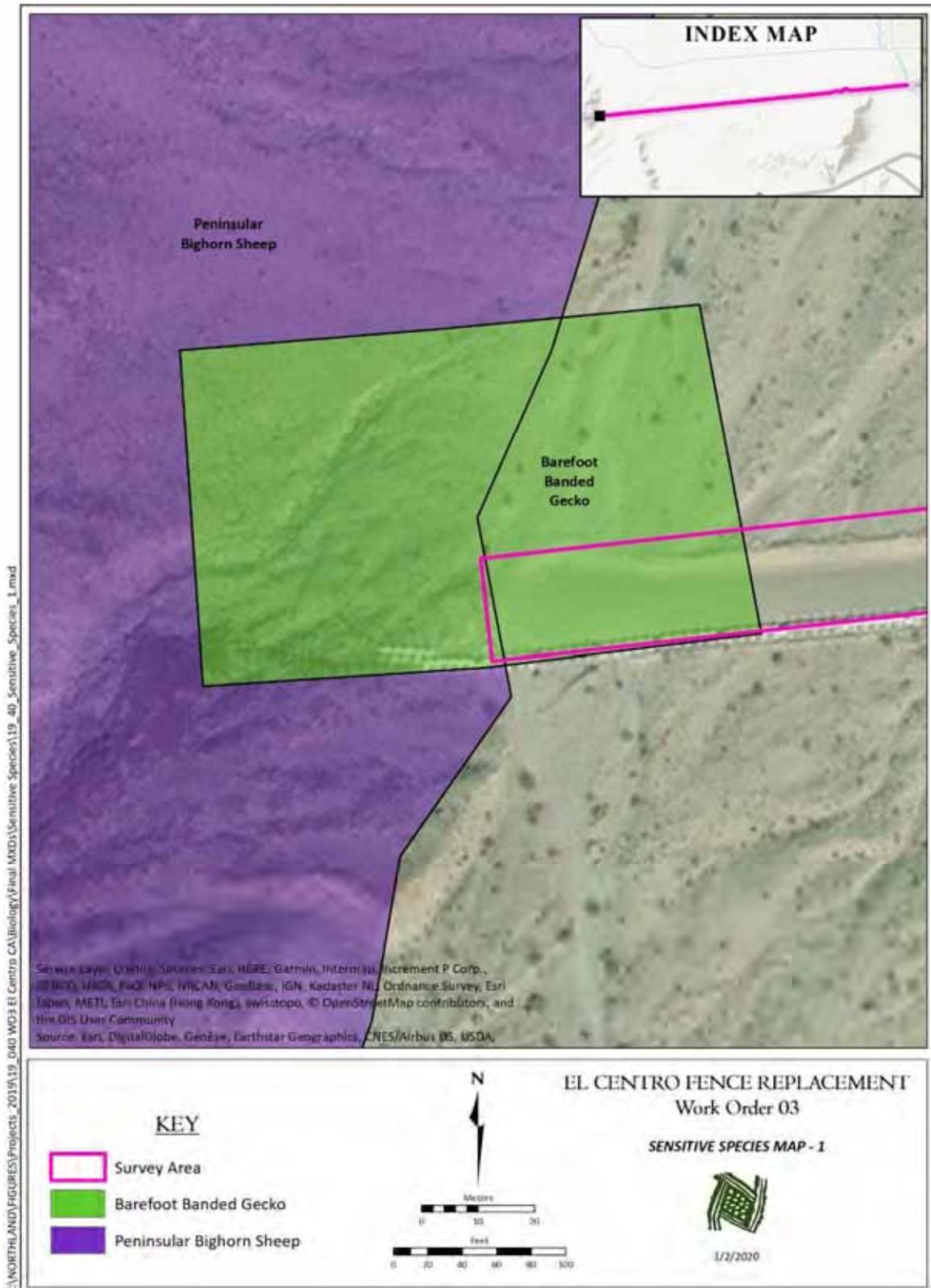
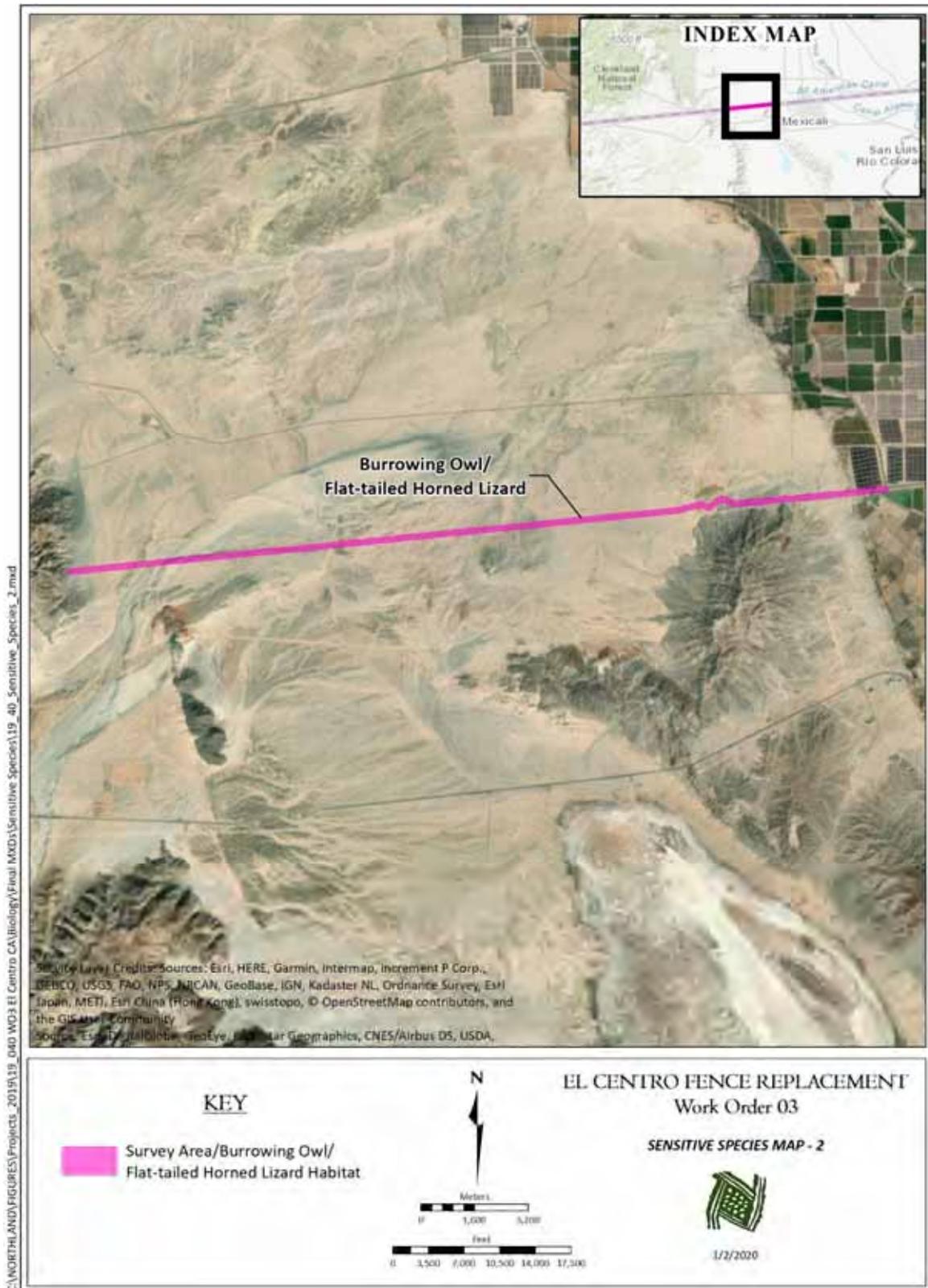


Figure 4: Special-Status Species Map





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Figure 4

Figure 5: Vegetation Communities Map



Figure 5

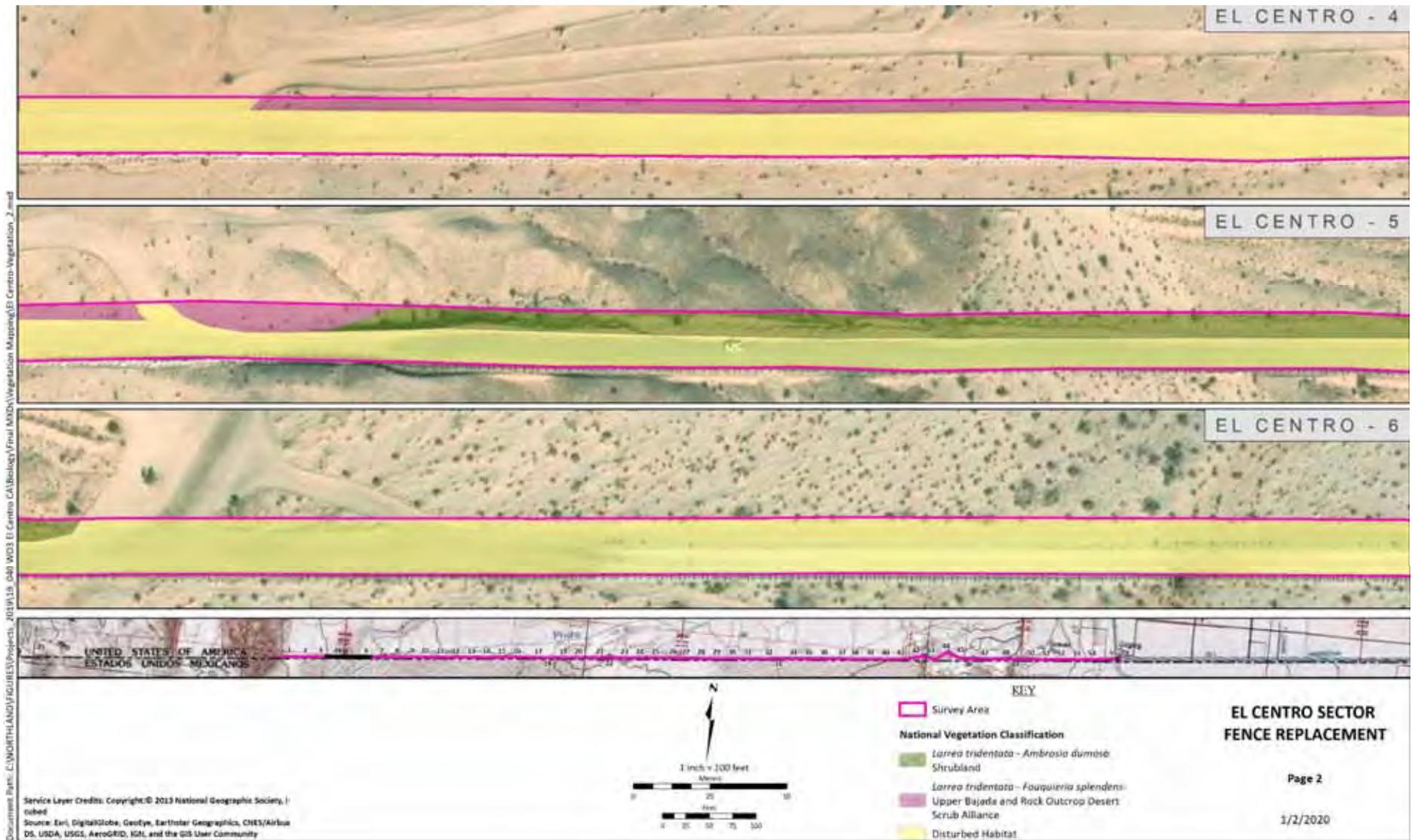


Figure 5



Figure 5

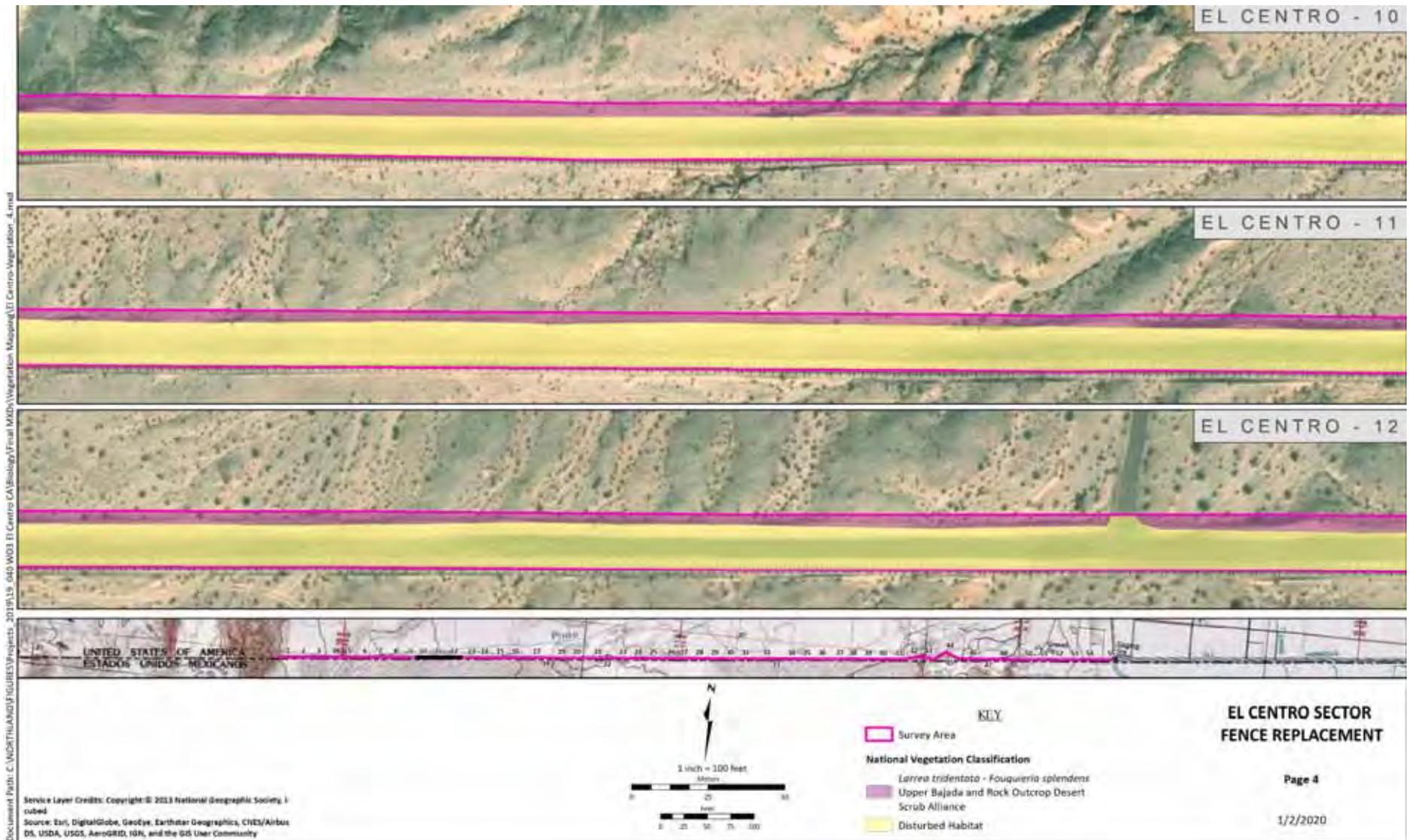


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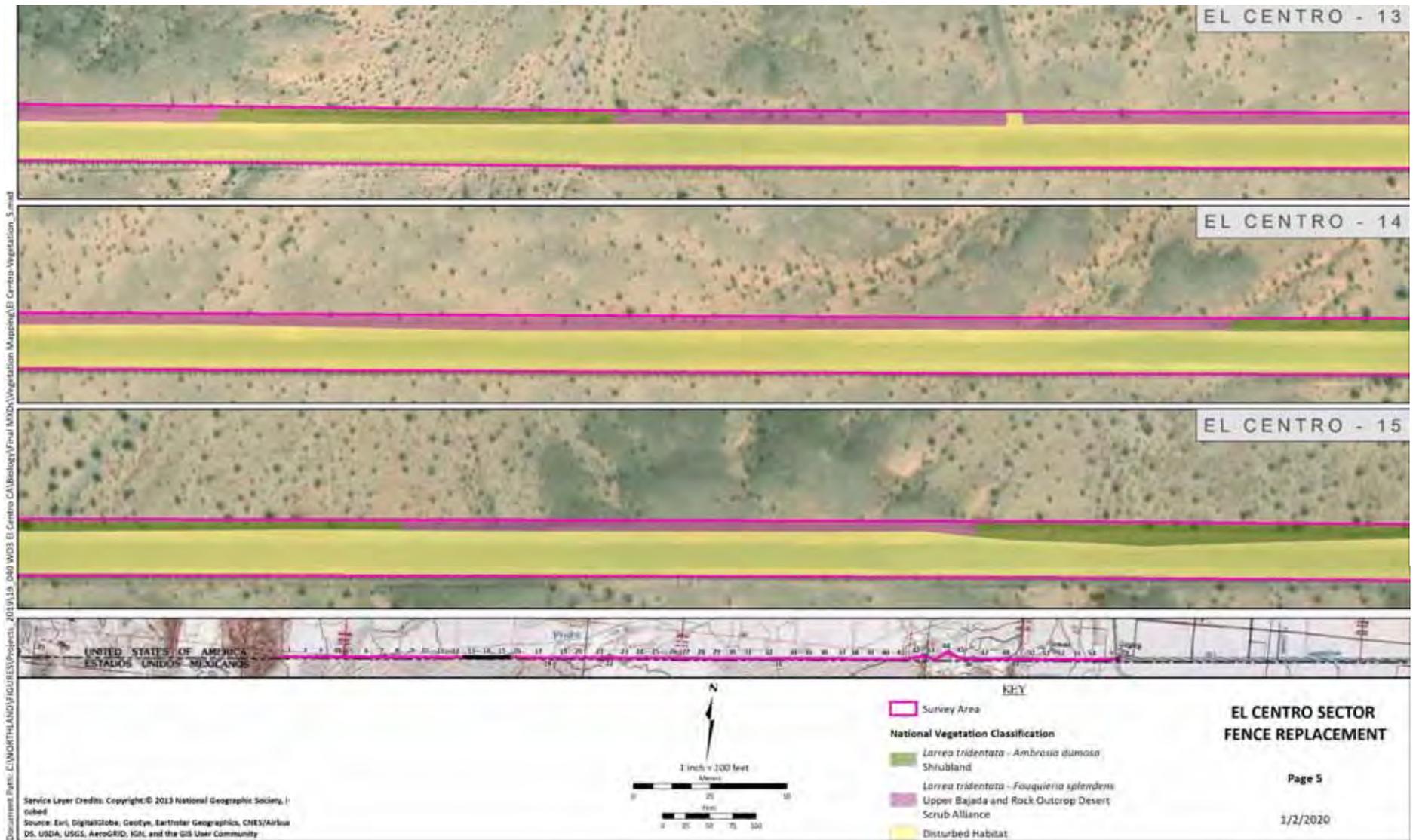


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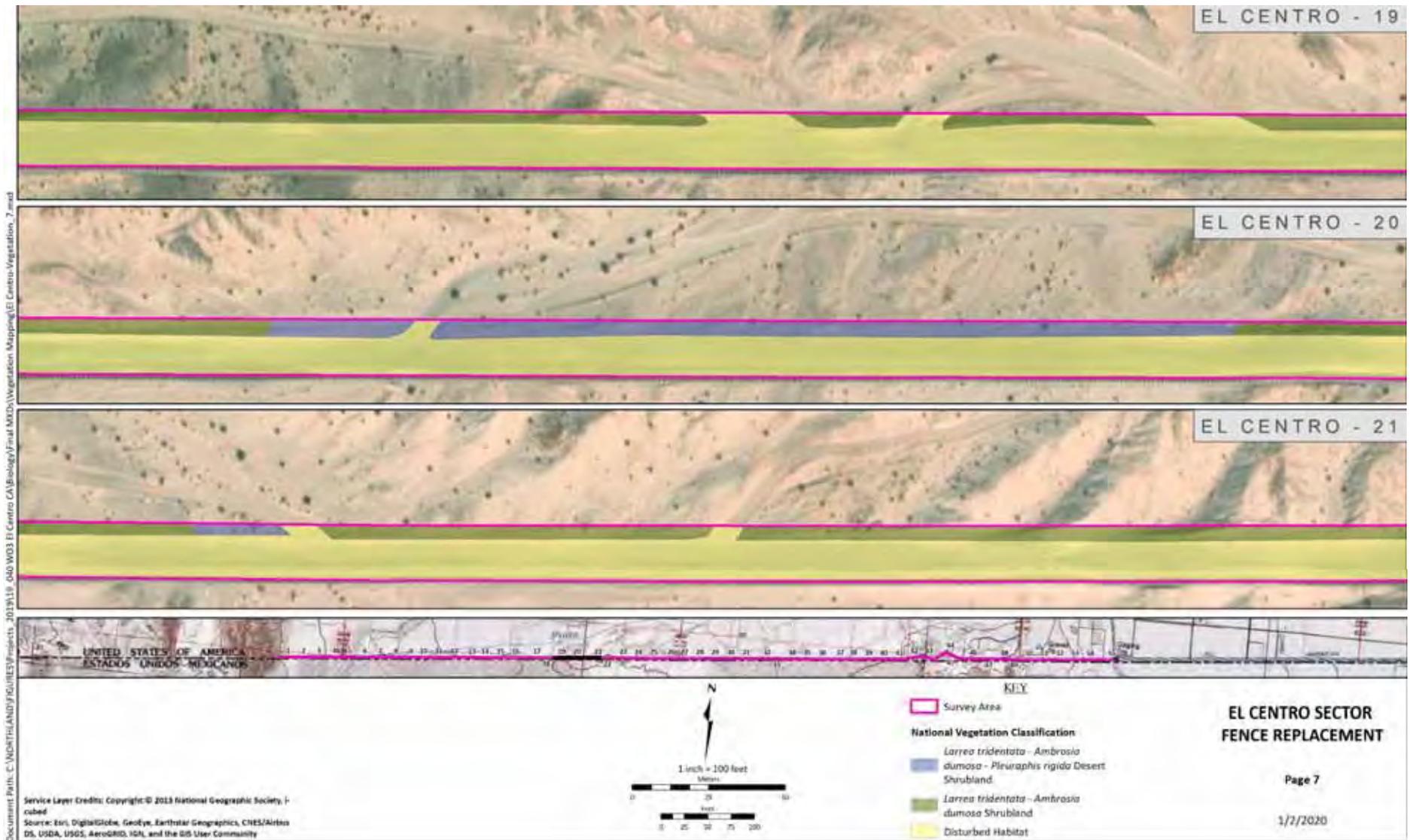


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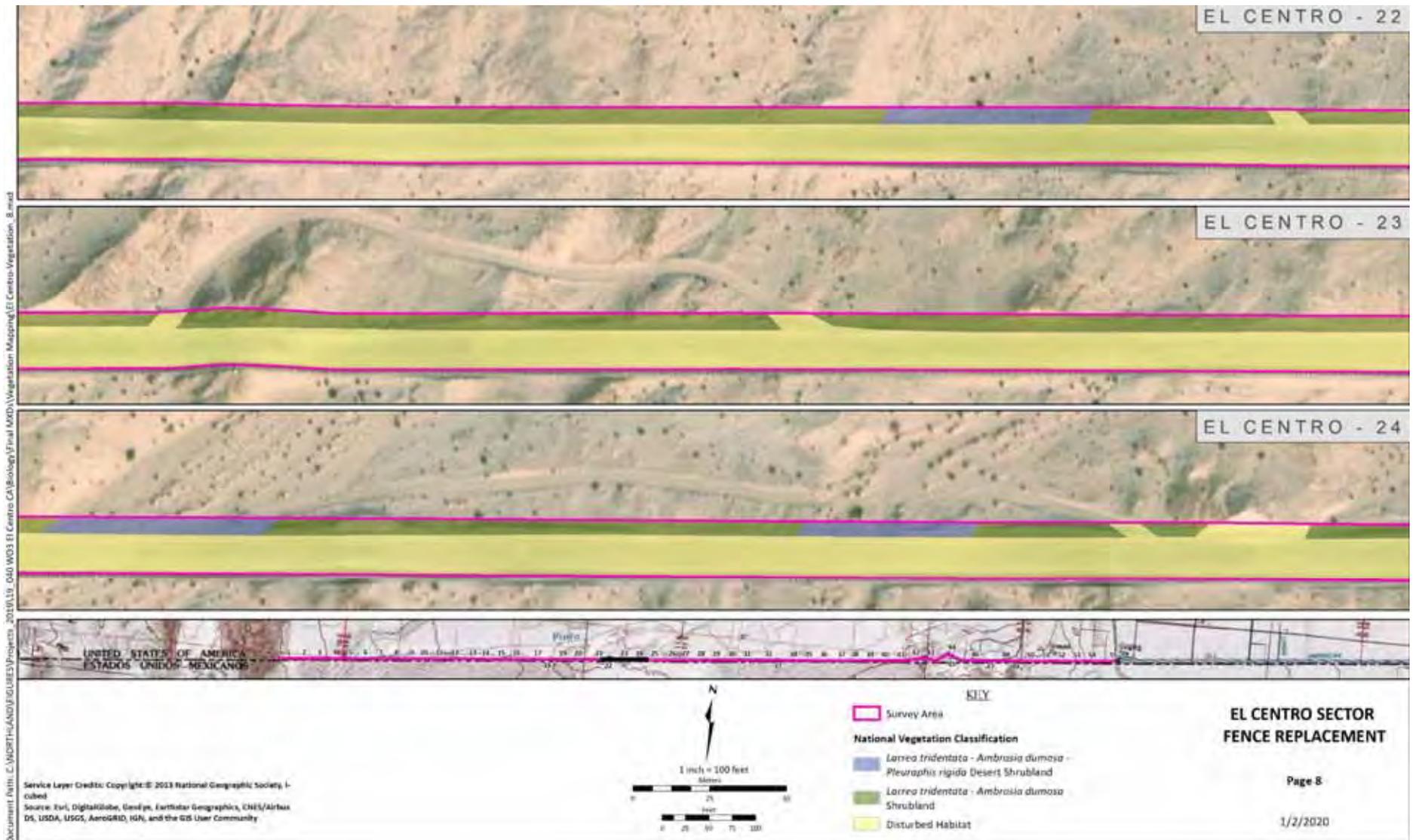


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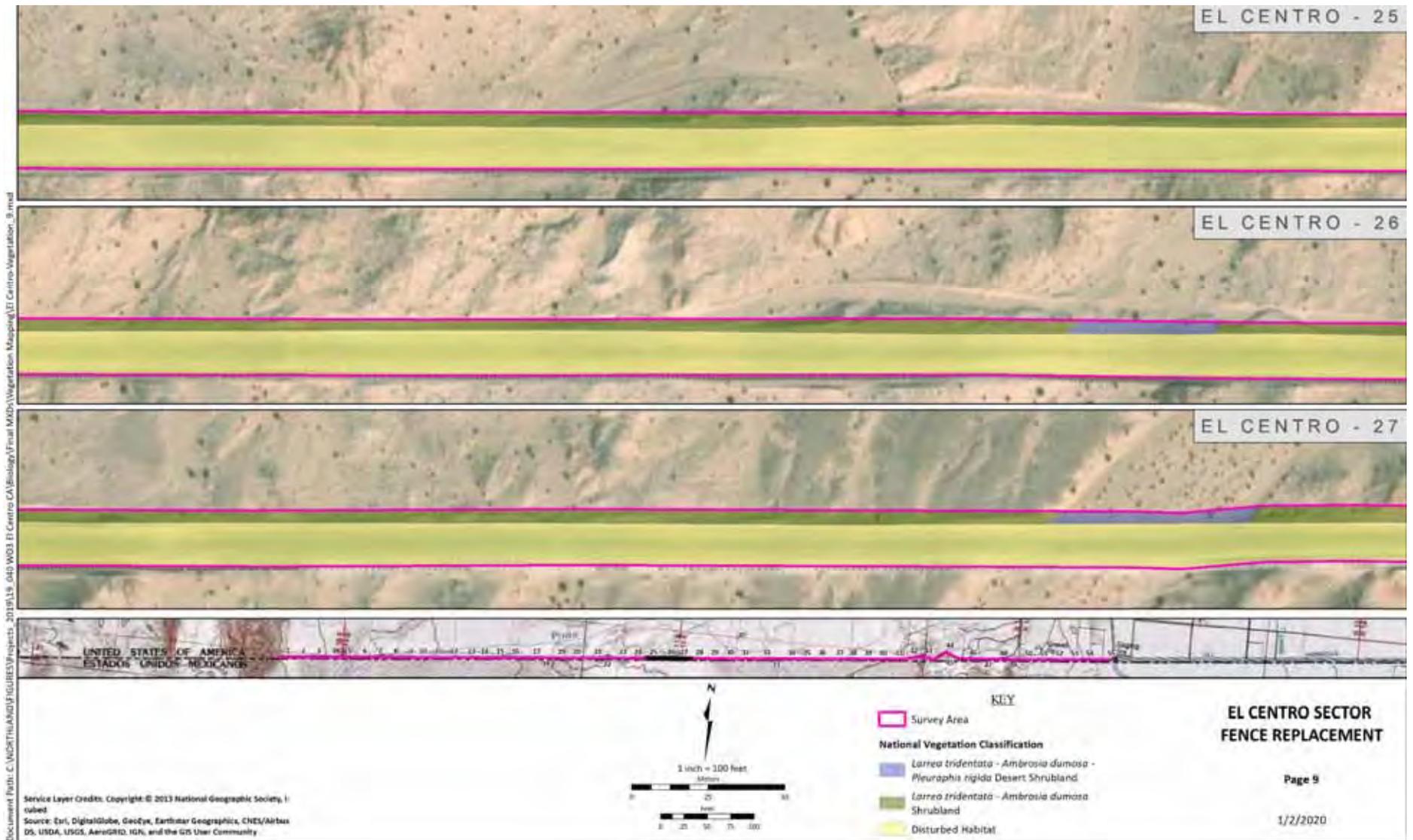


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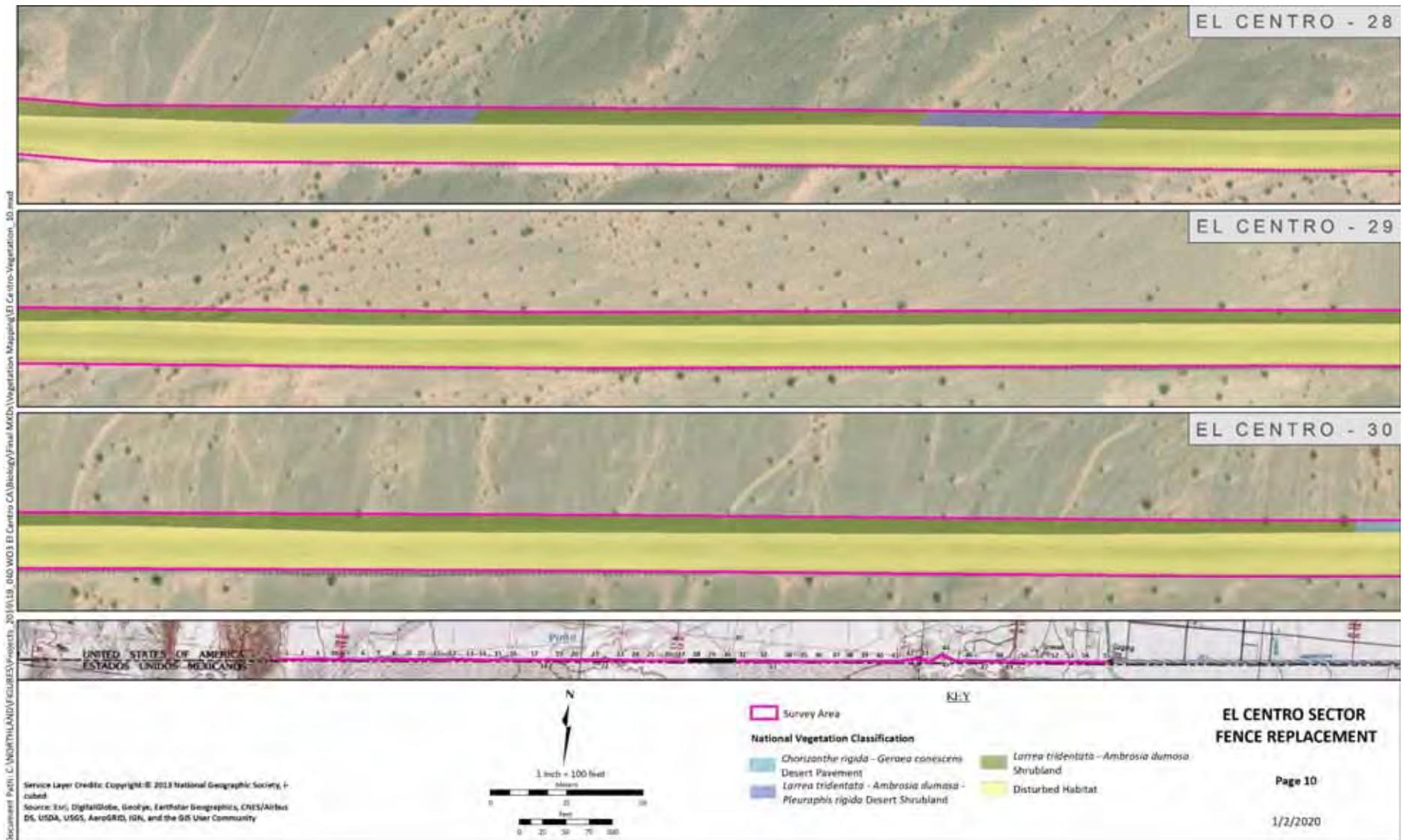


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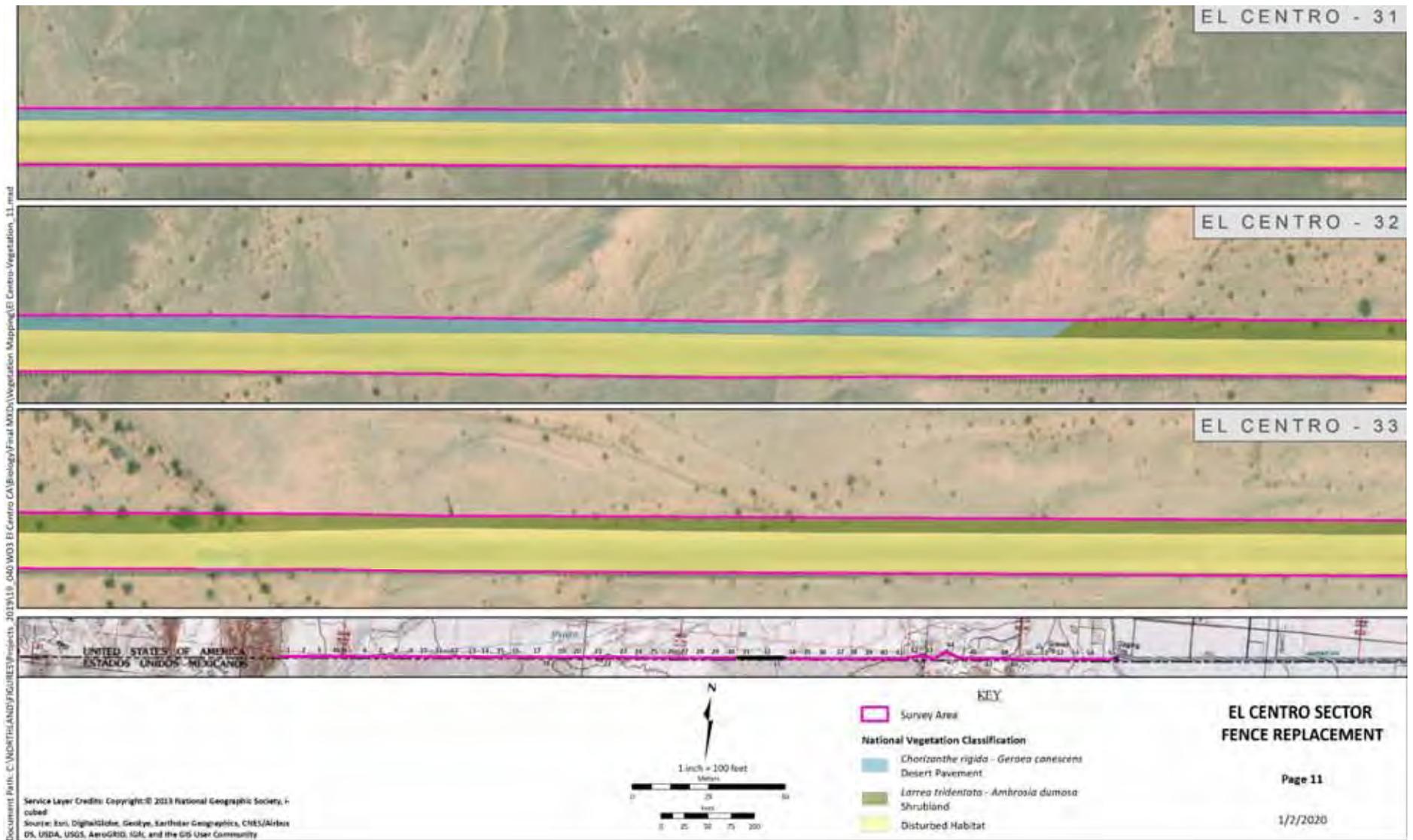


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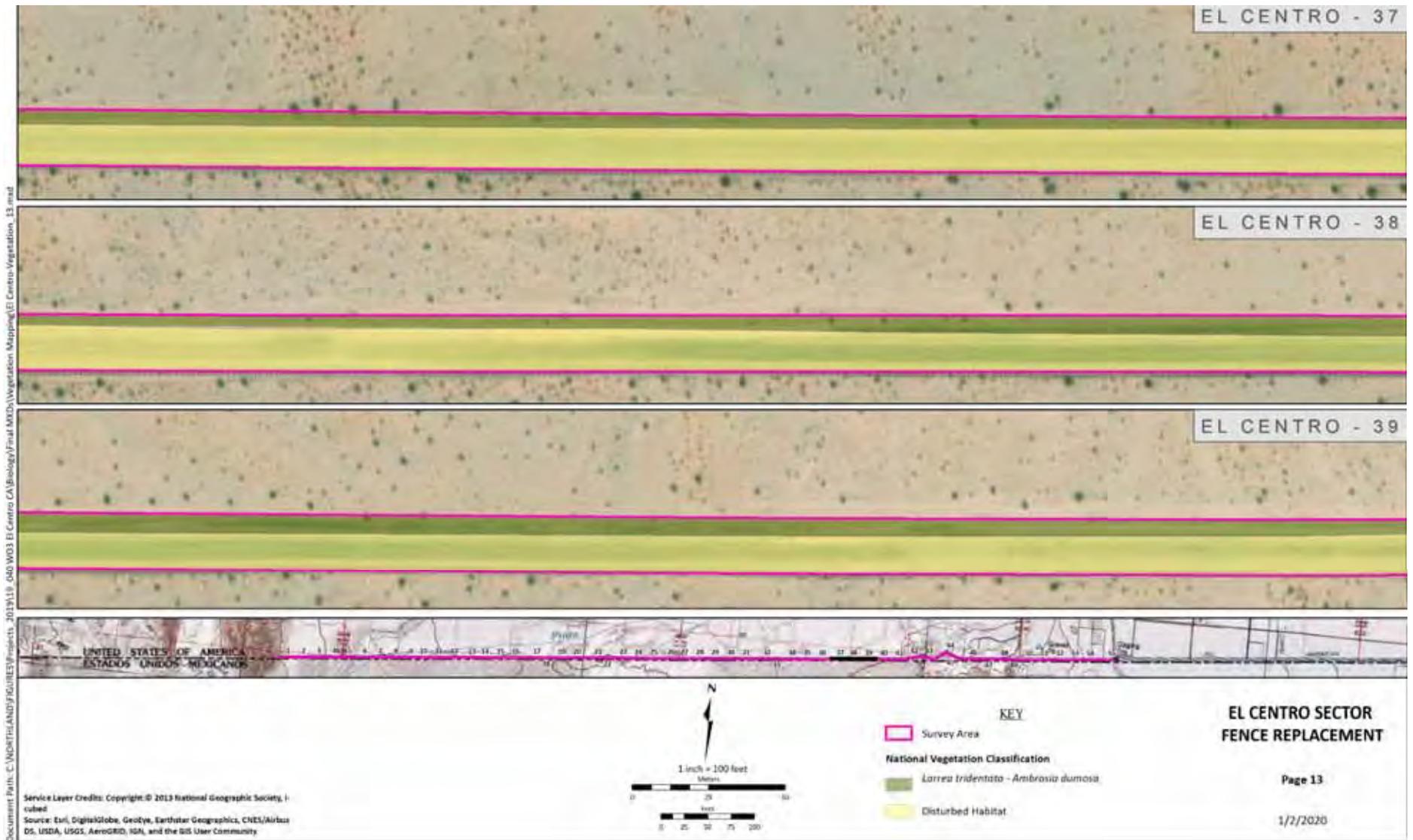


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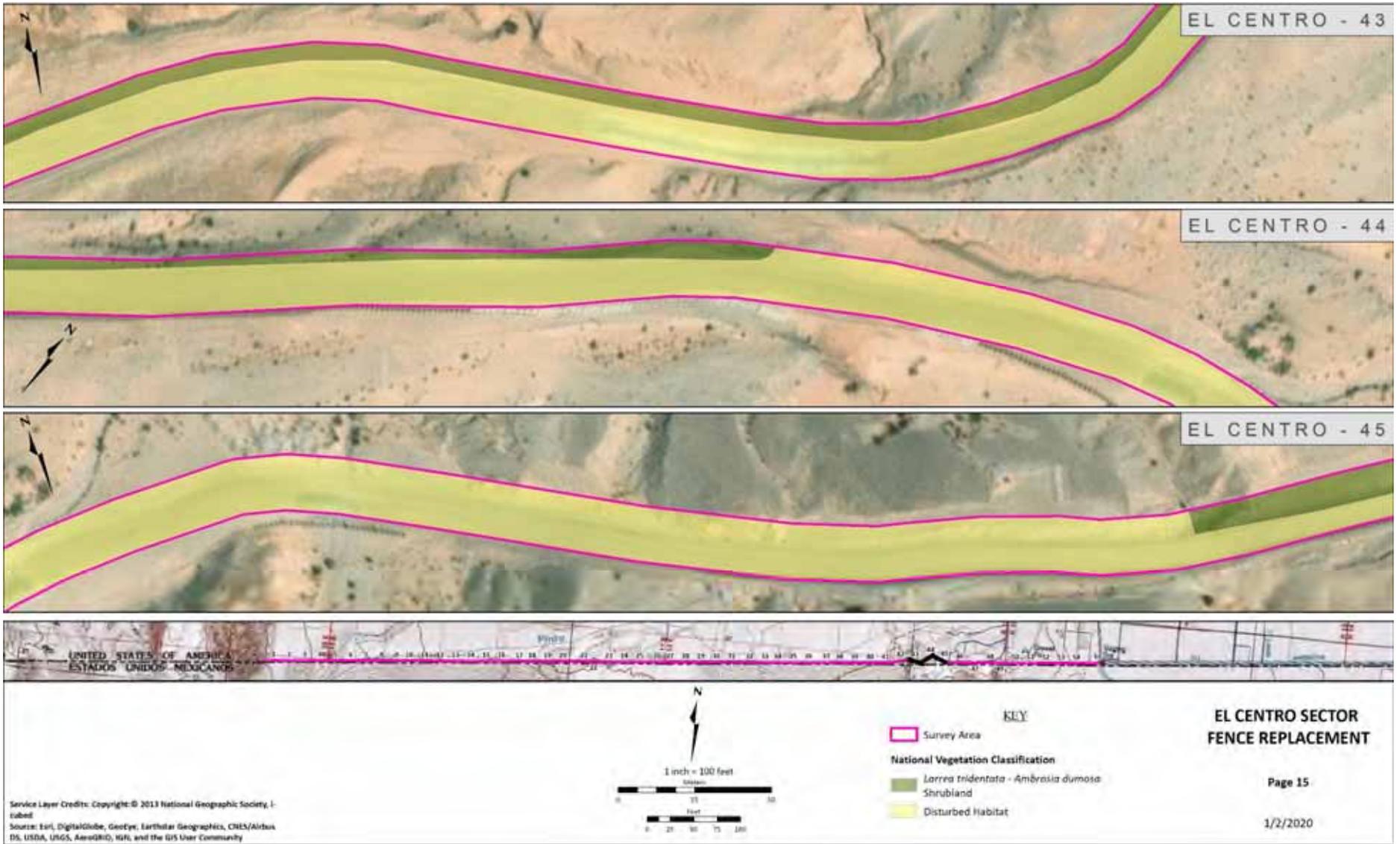


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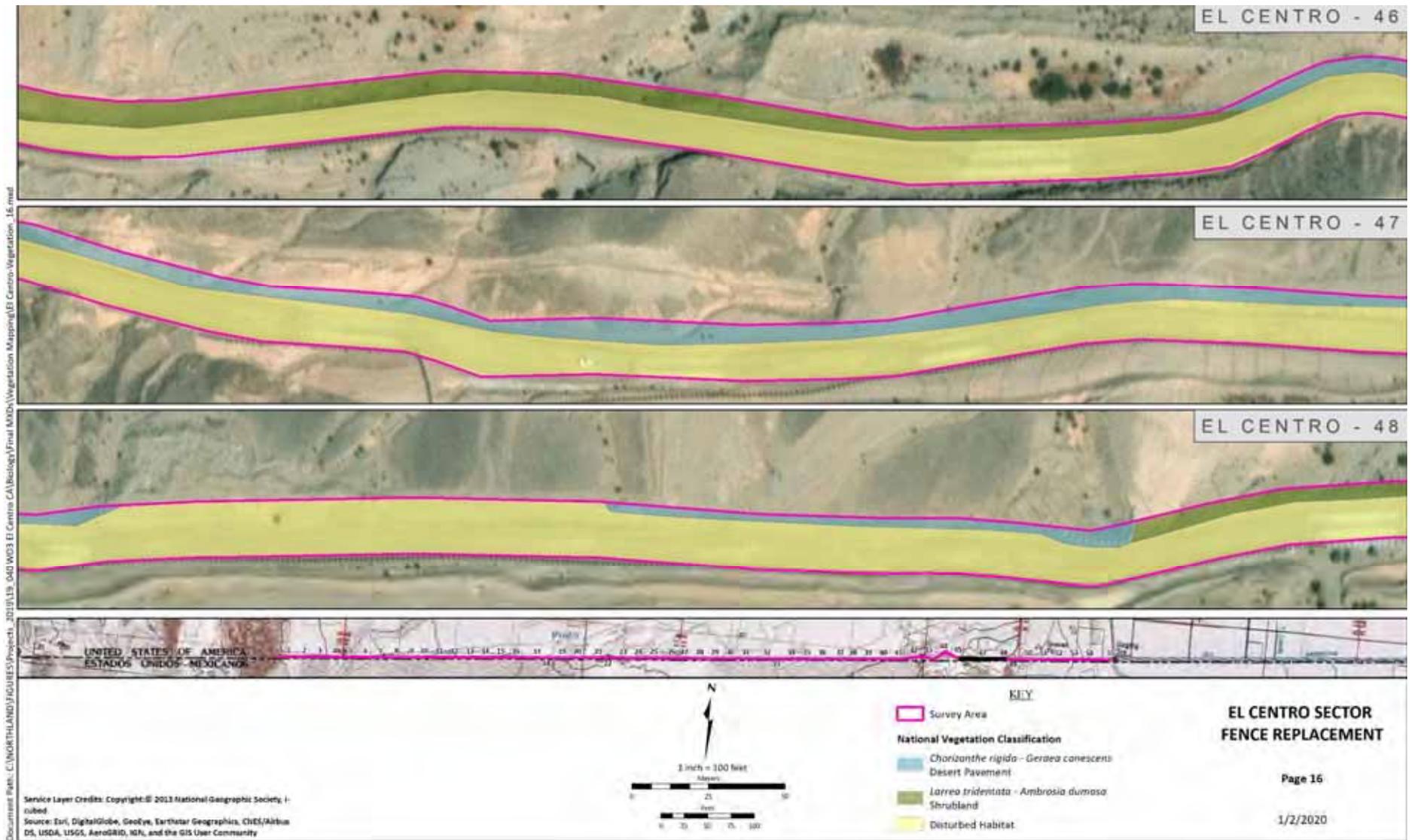


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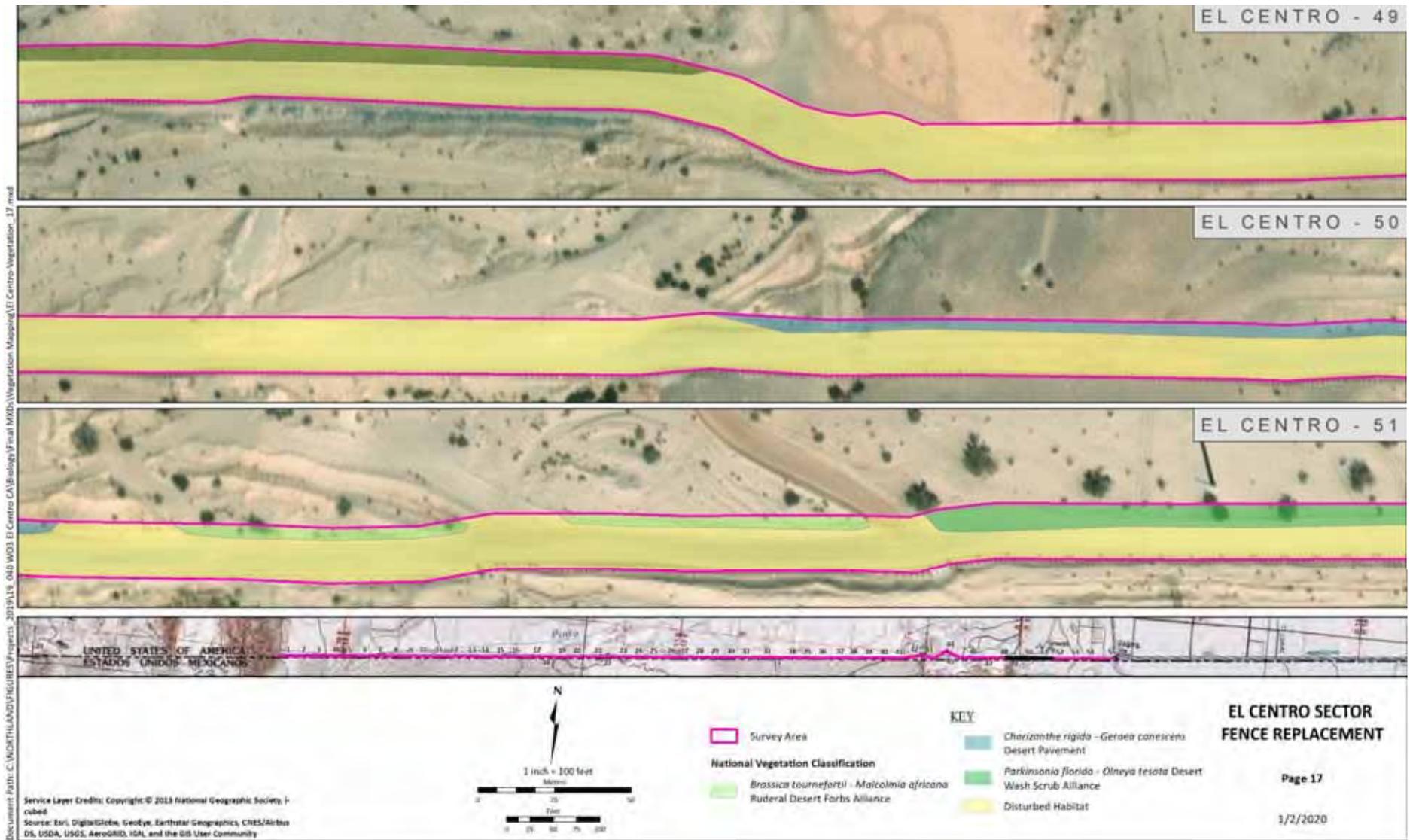


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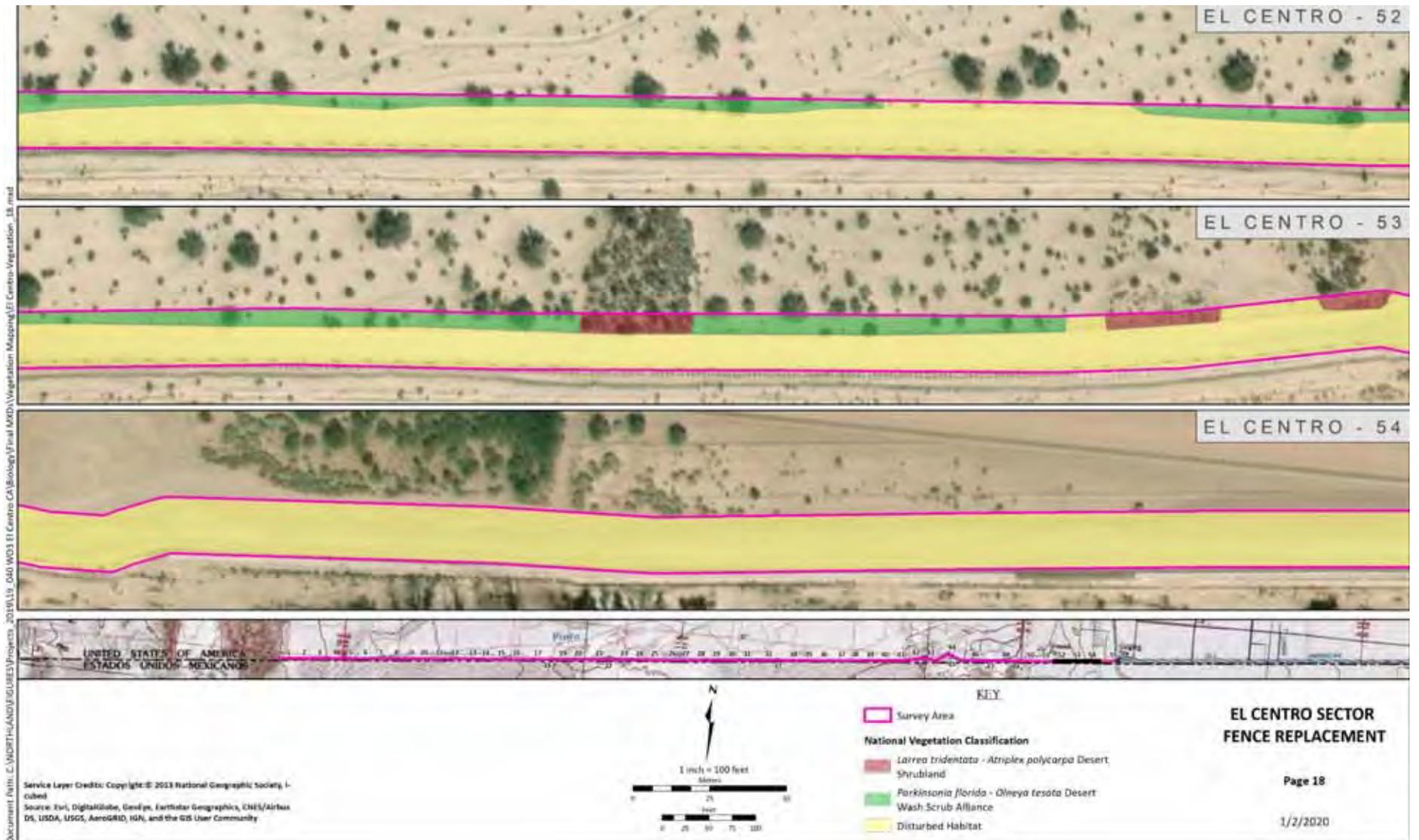


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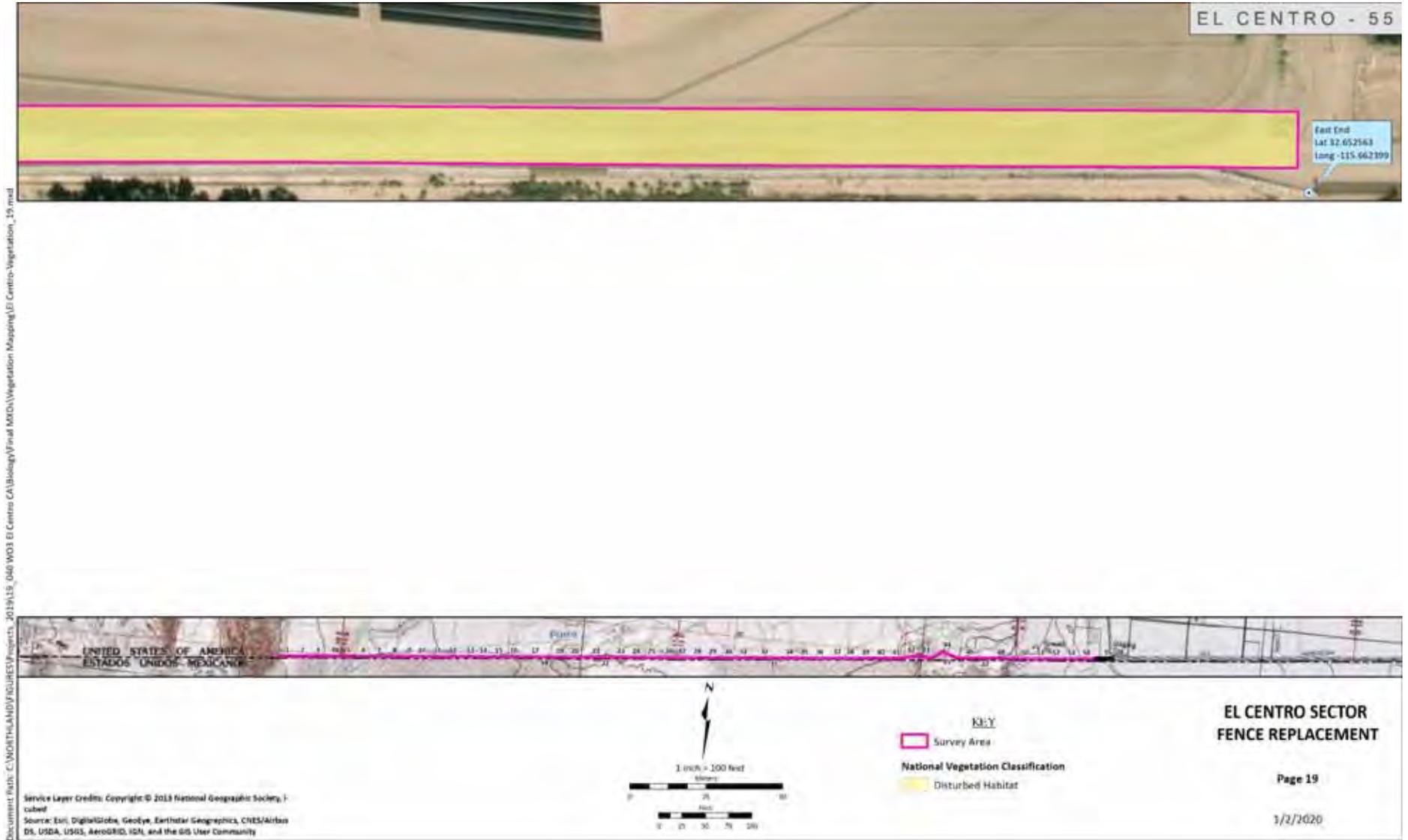


Figure 5

Figure 6: Jurisdictional Assessment Map

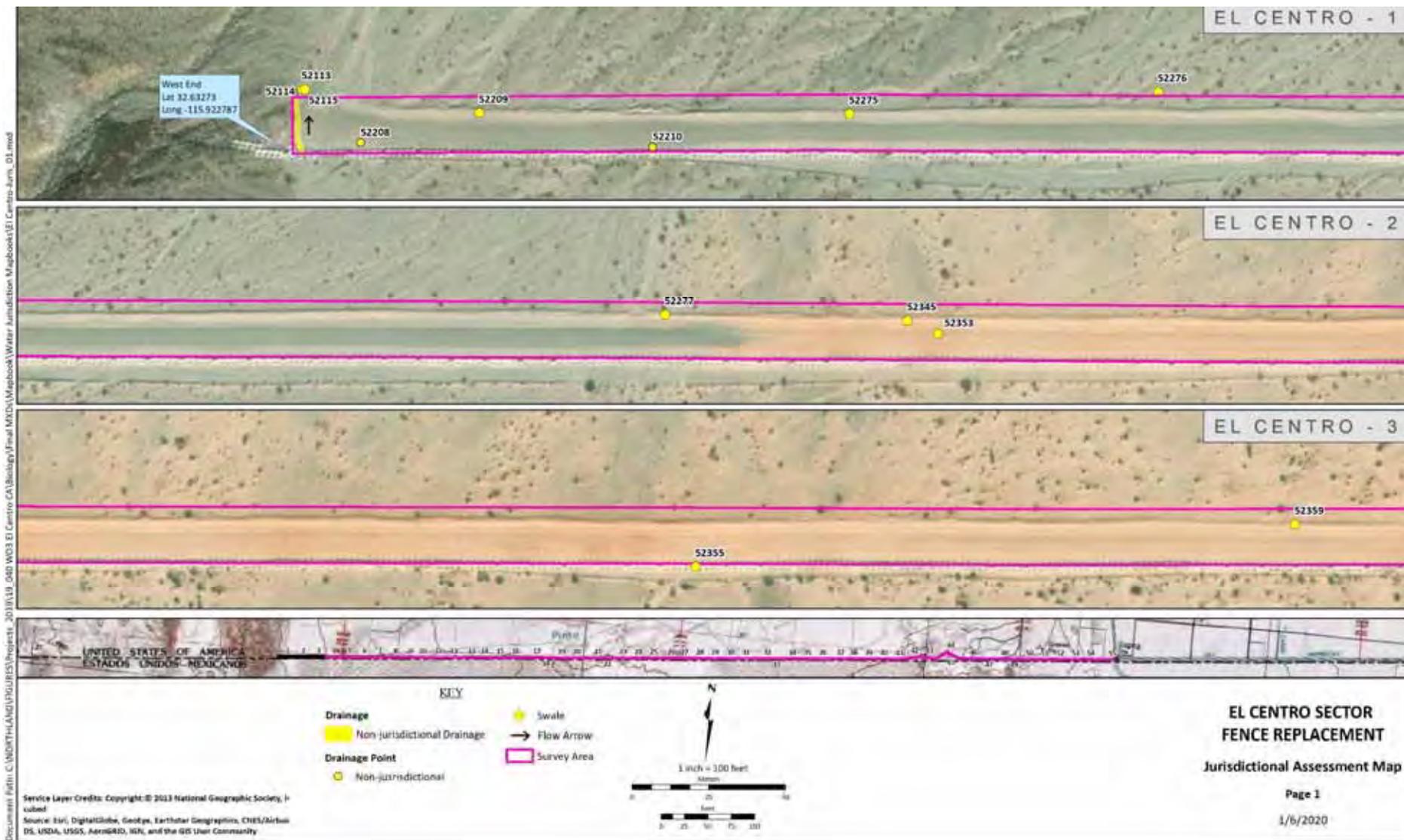


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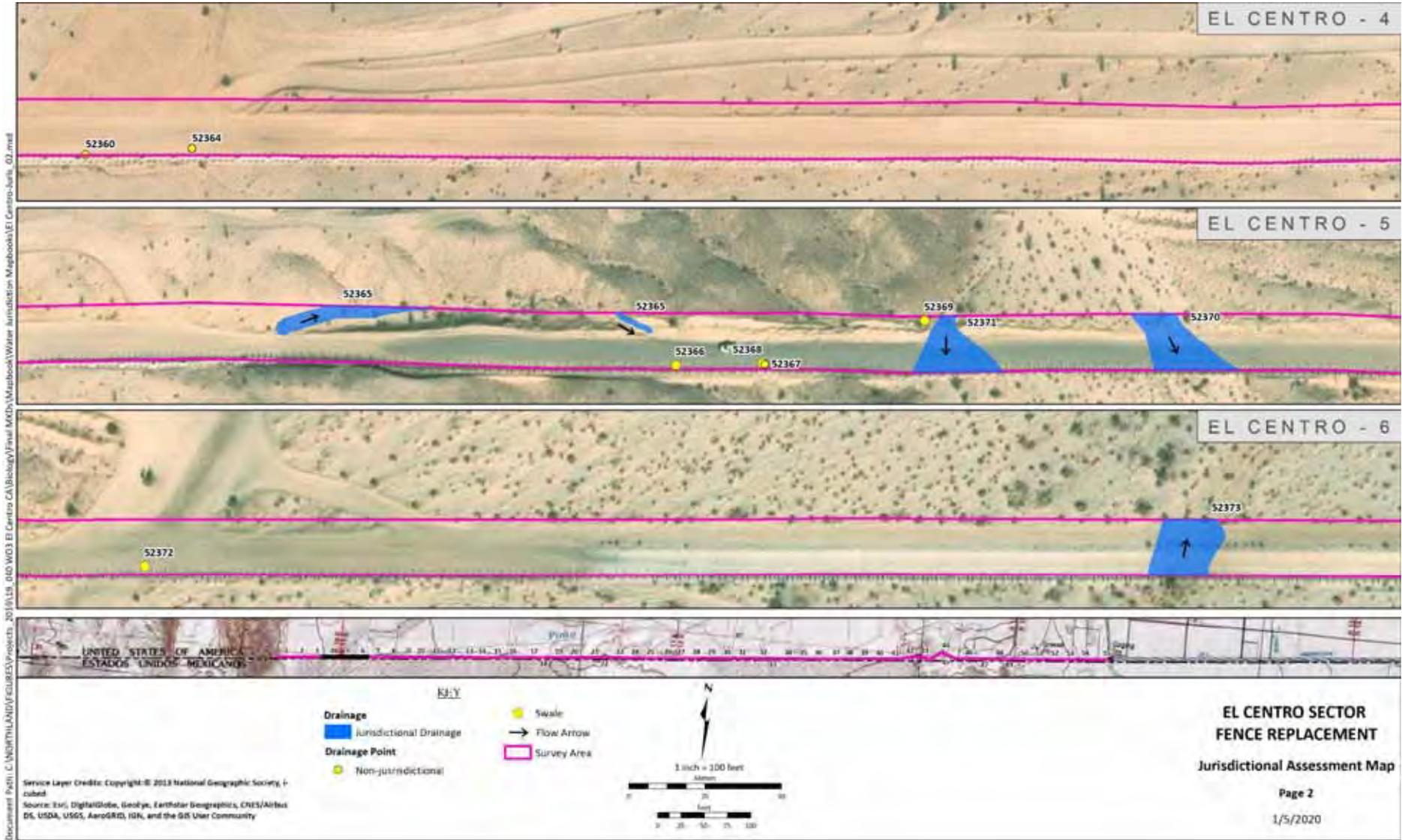


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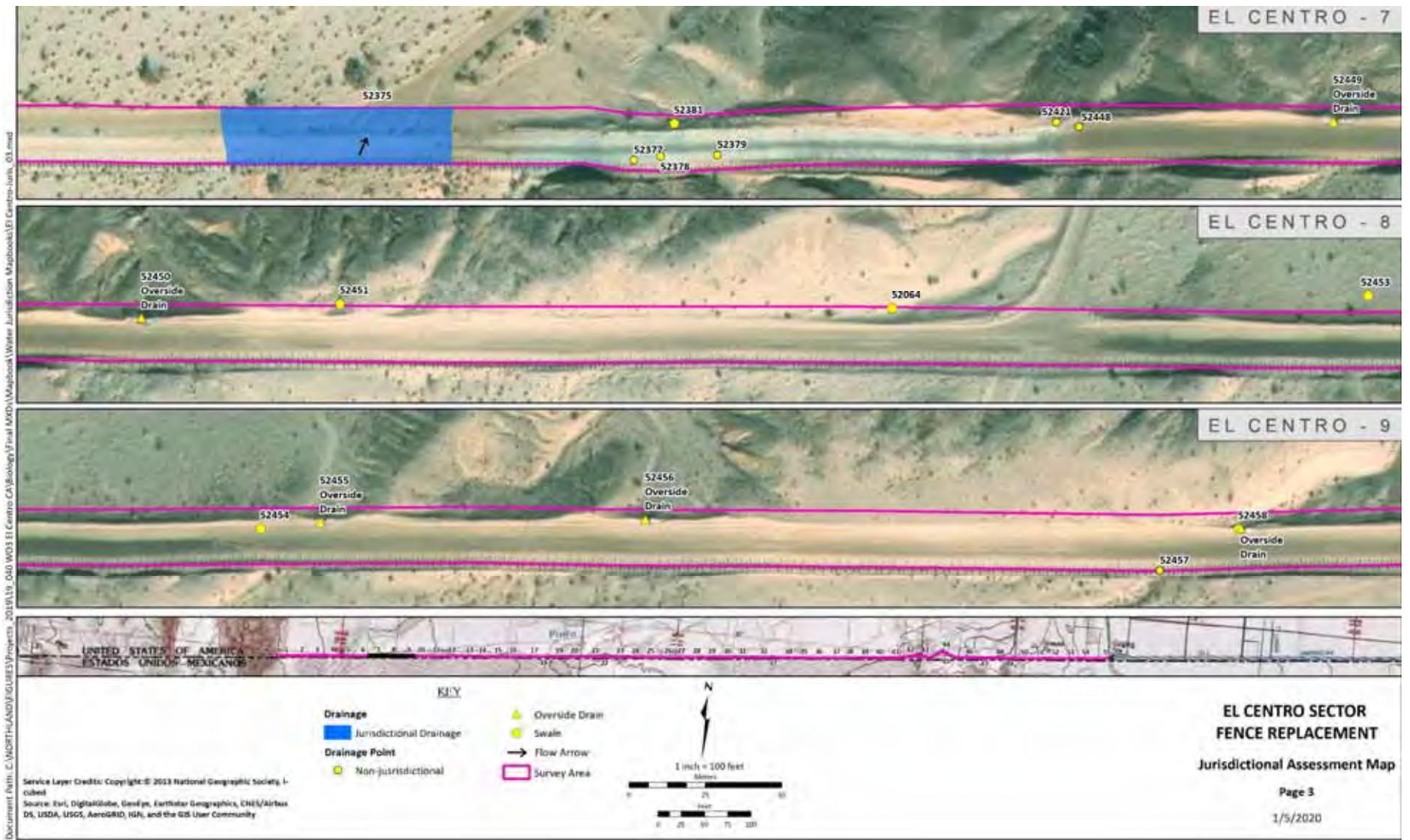


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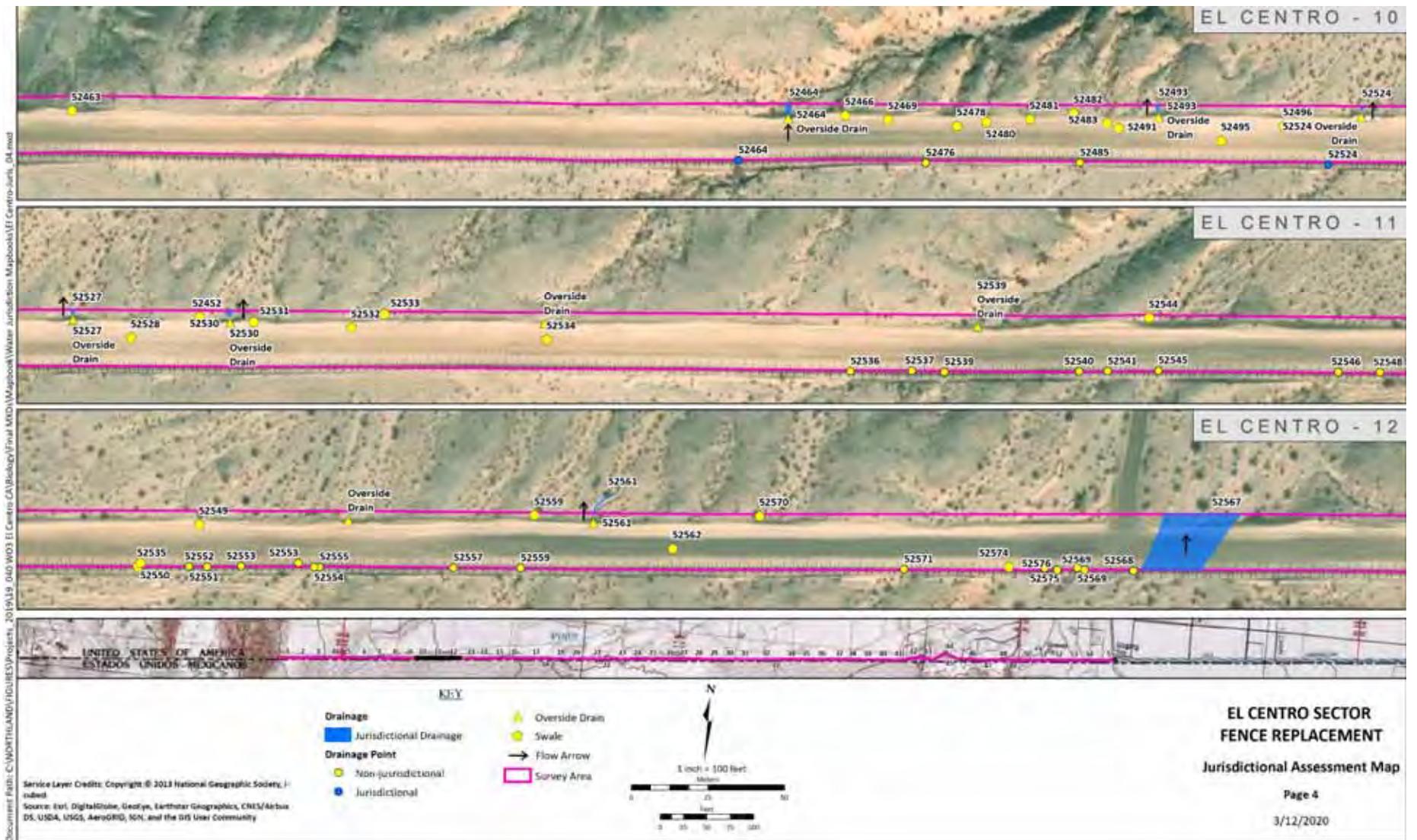


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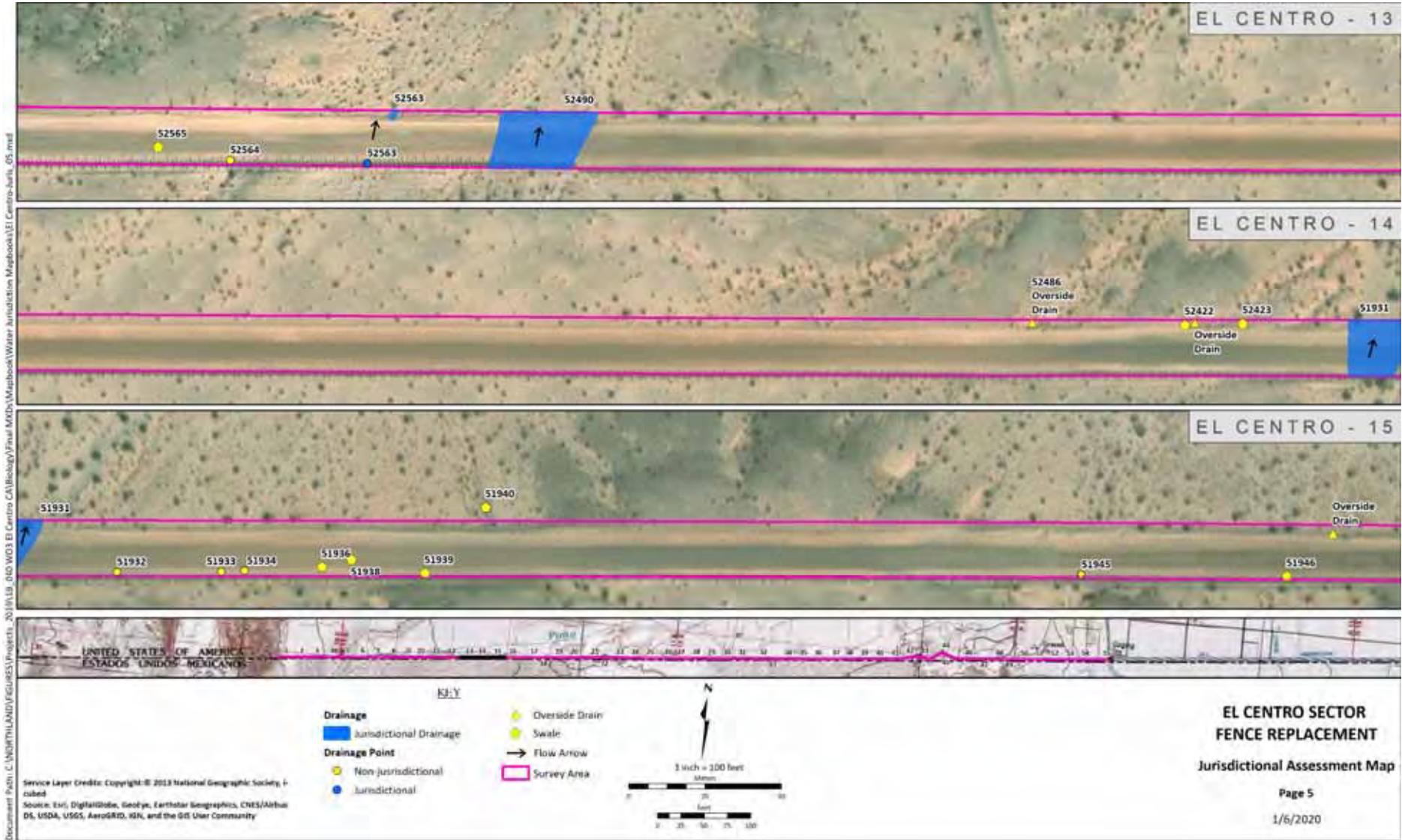


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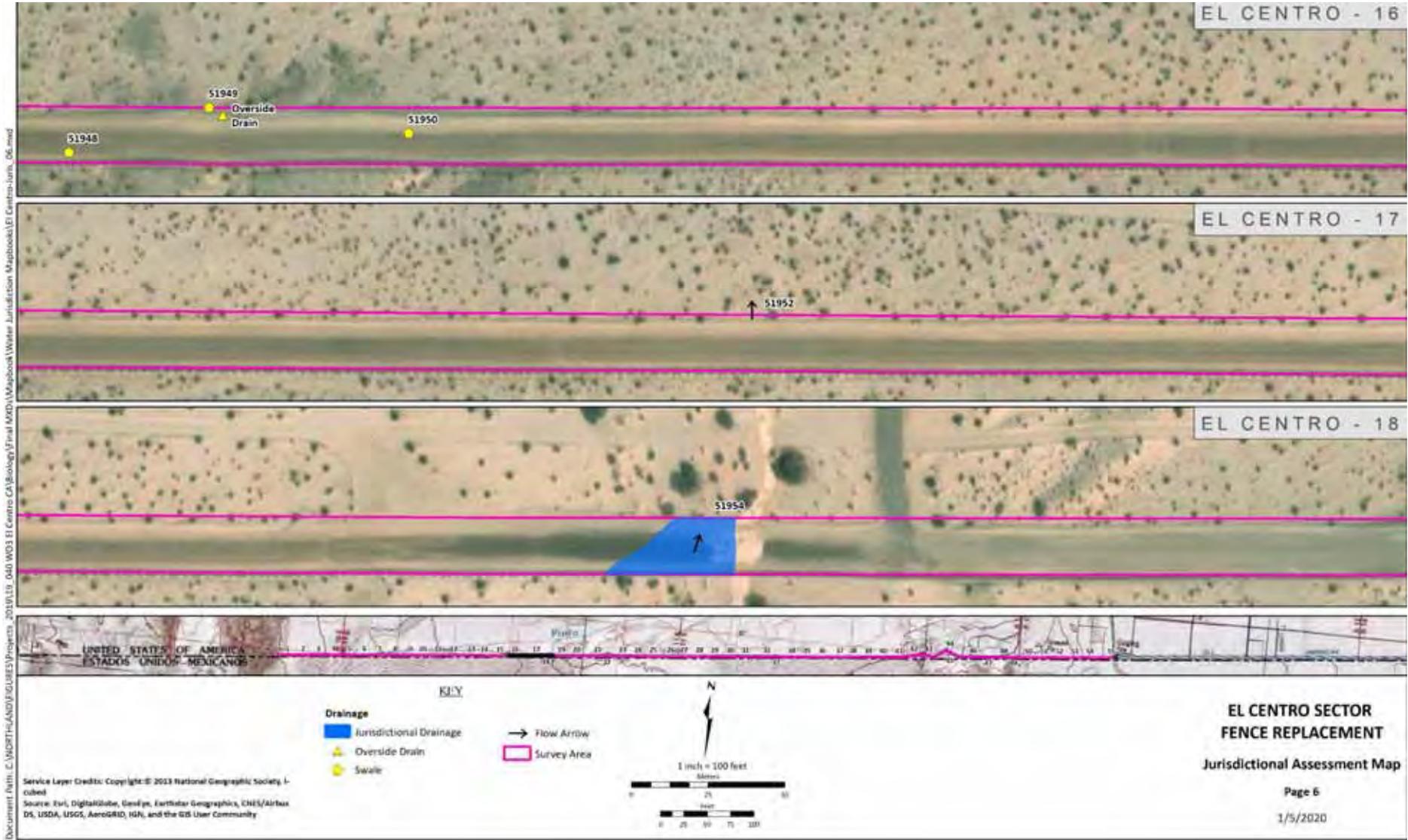


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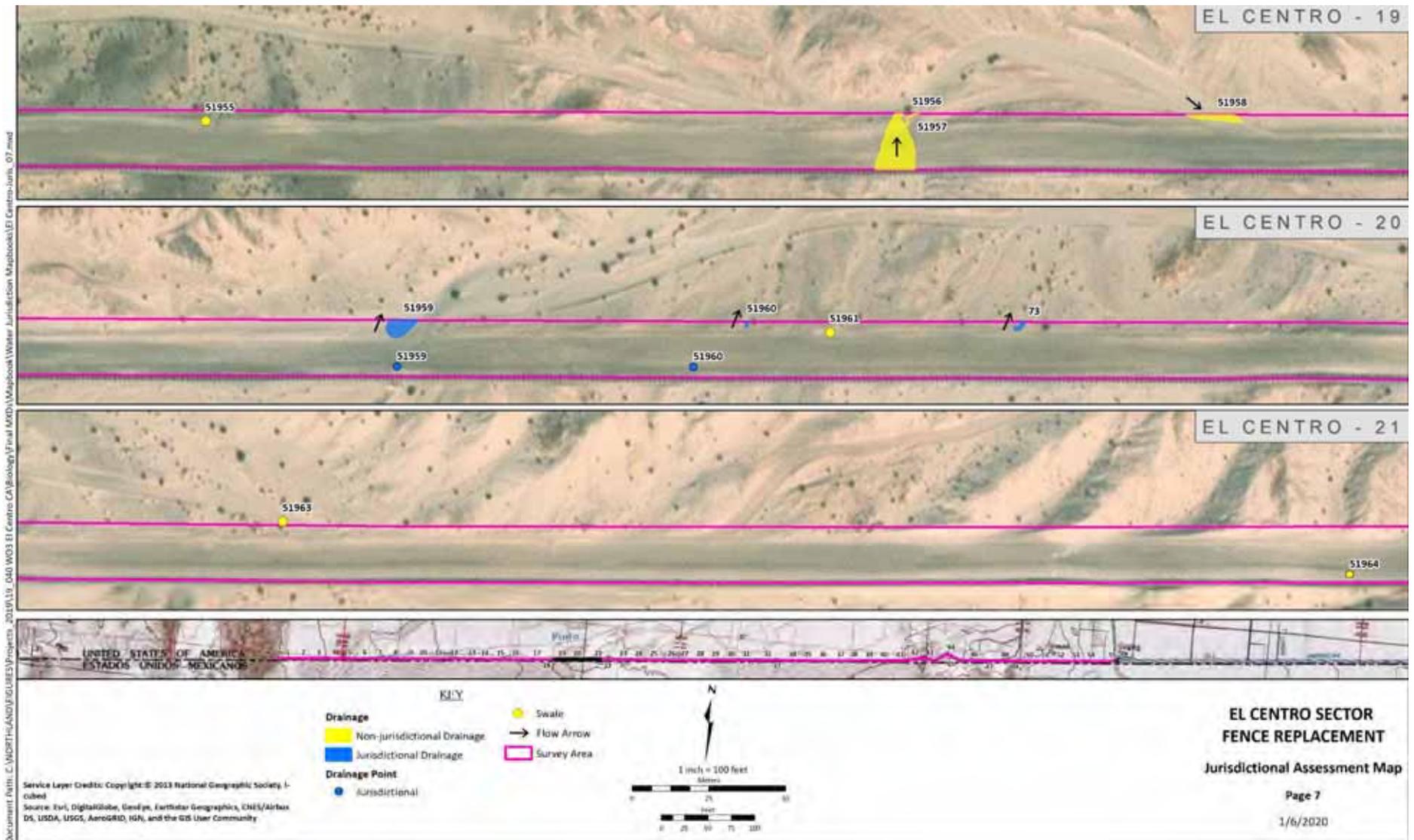


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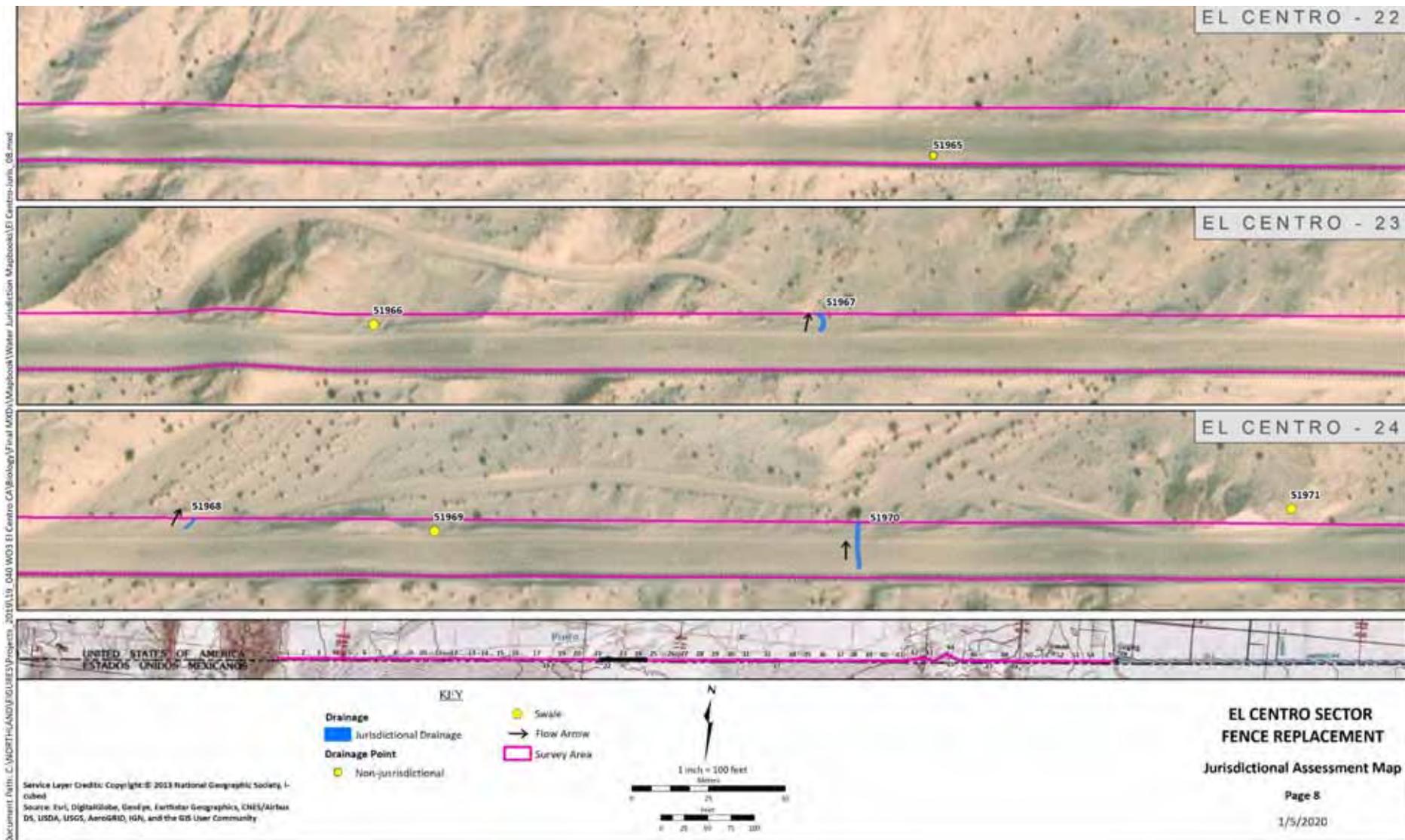


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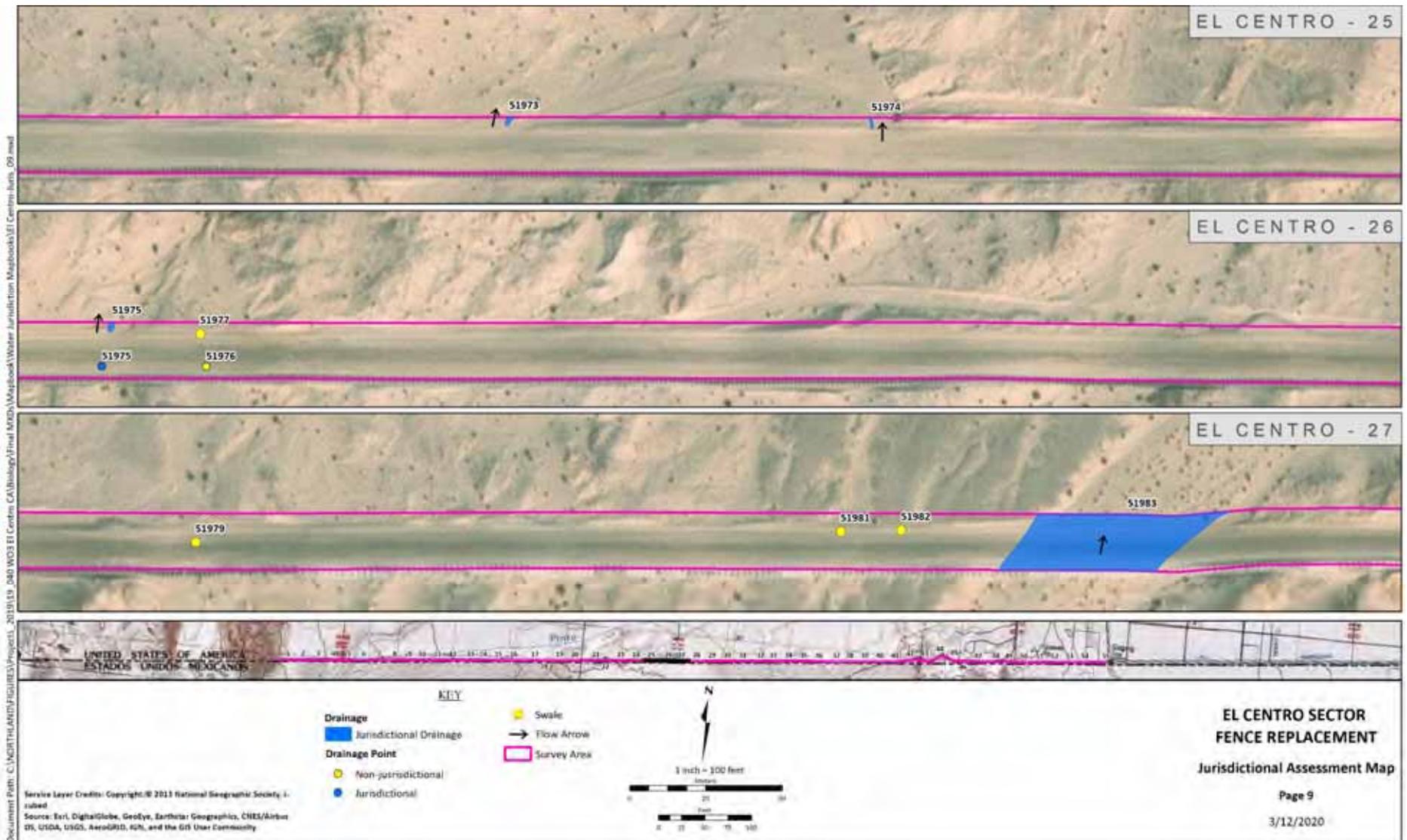


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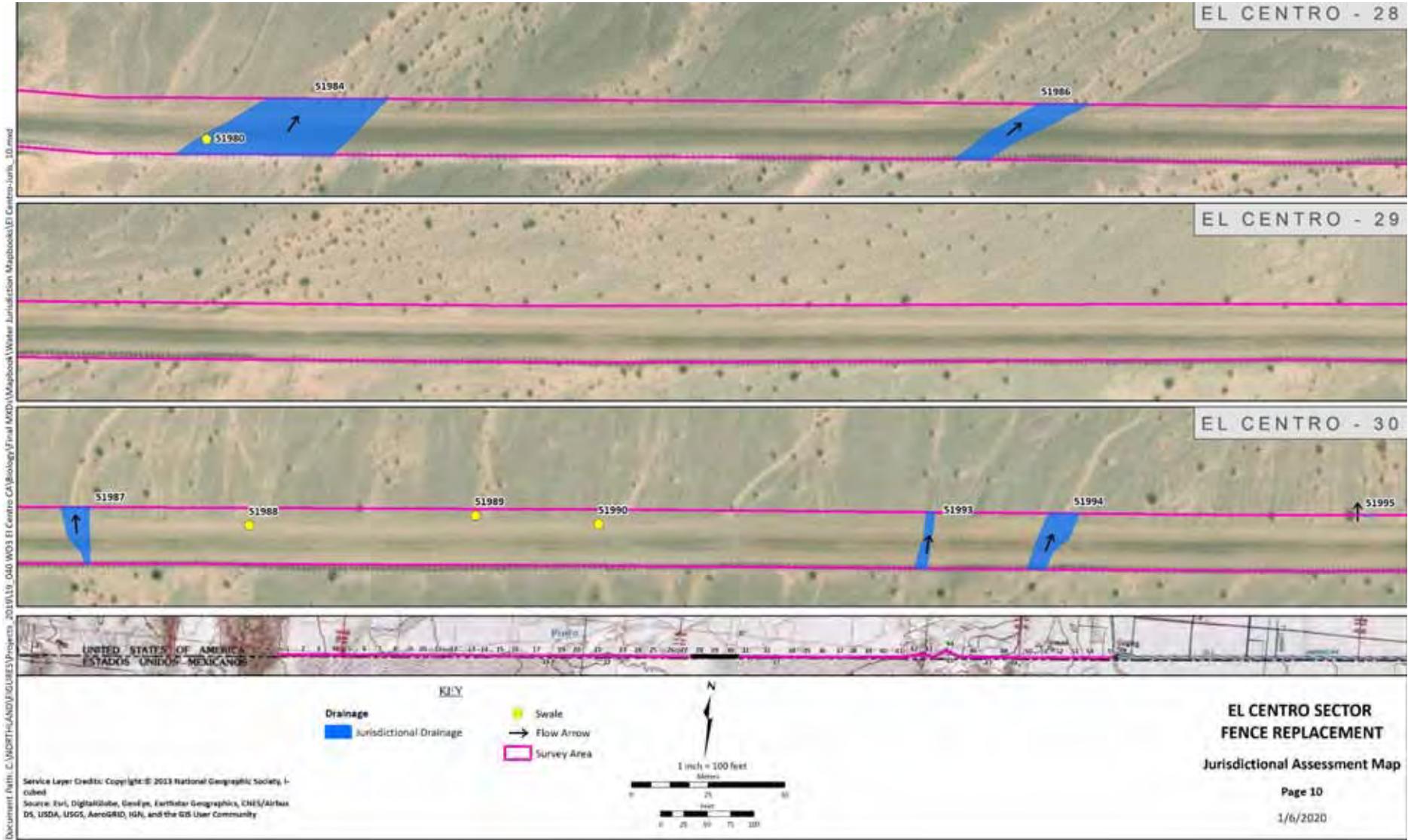


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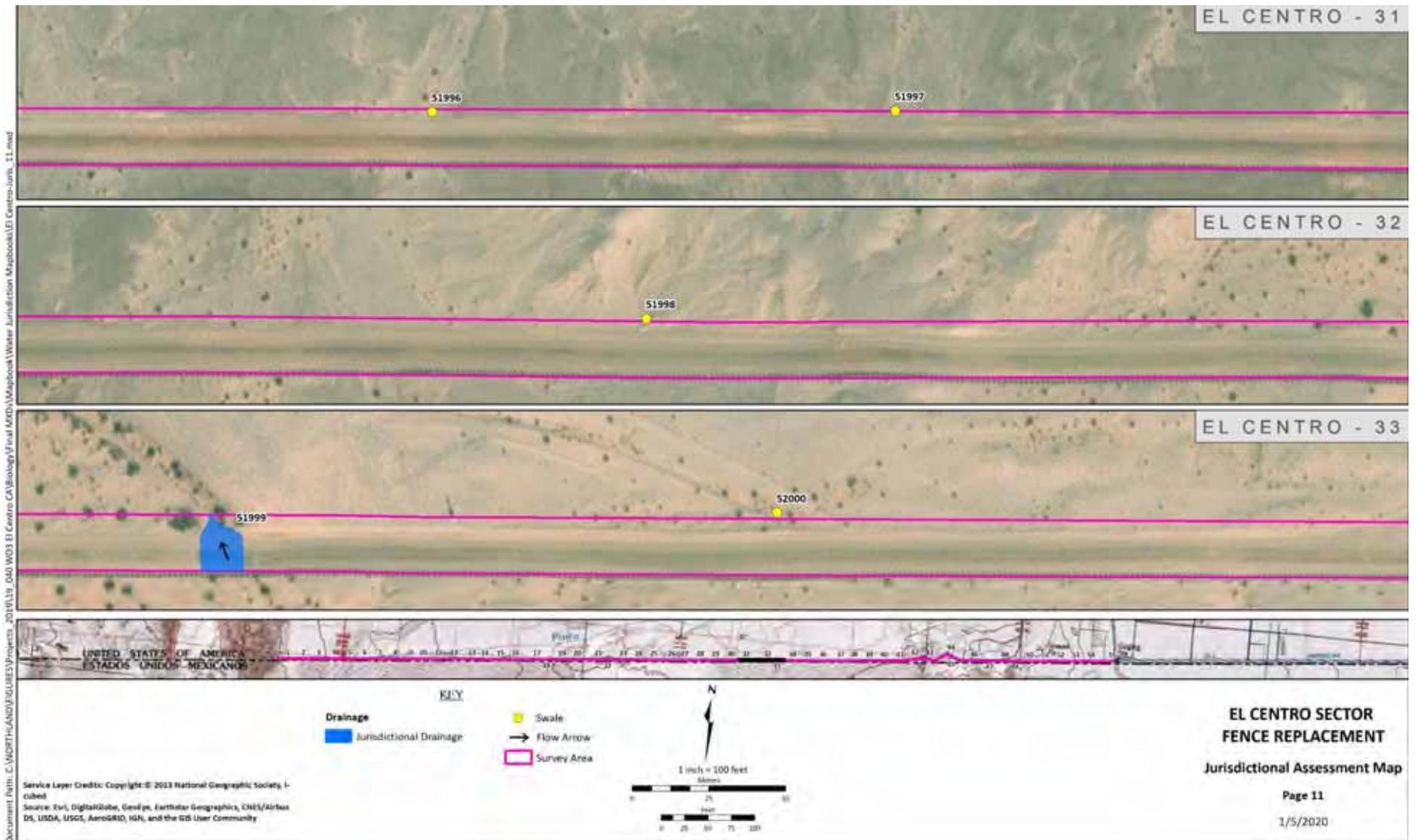


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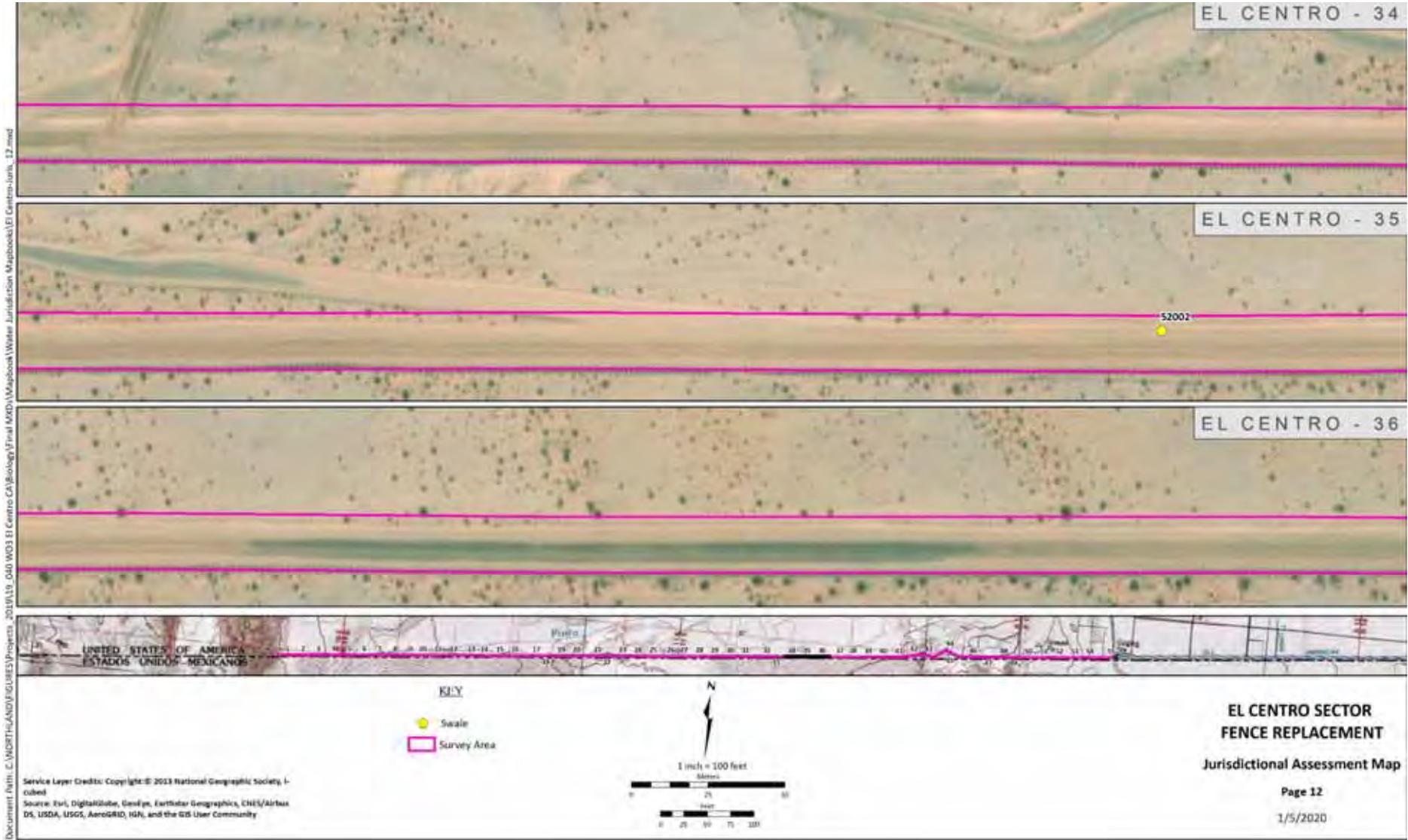


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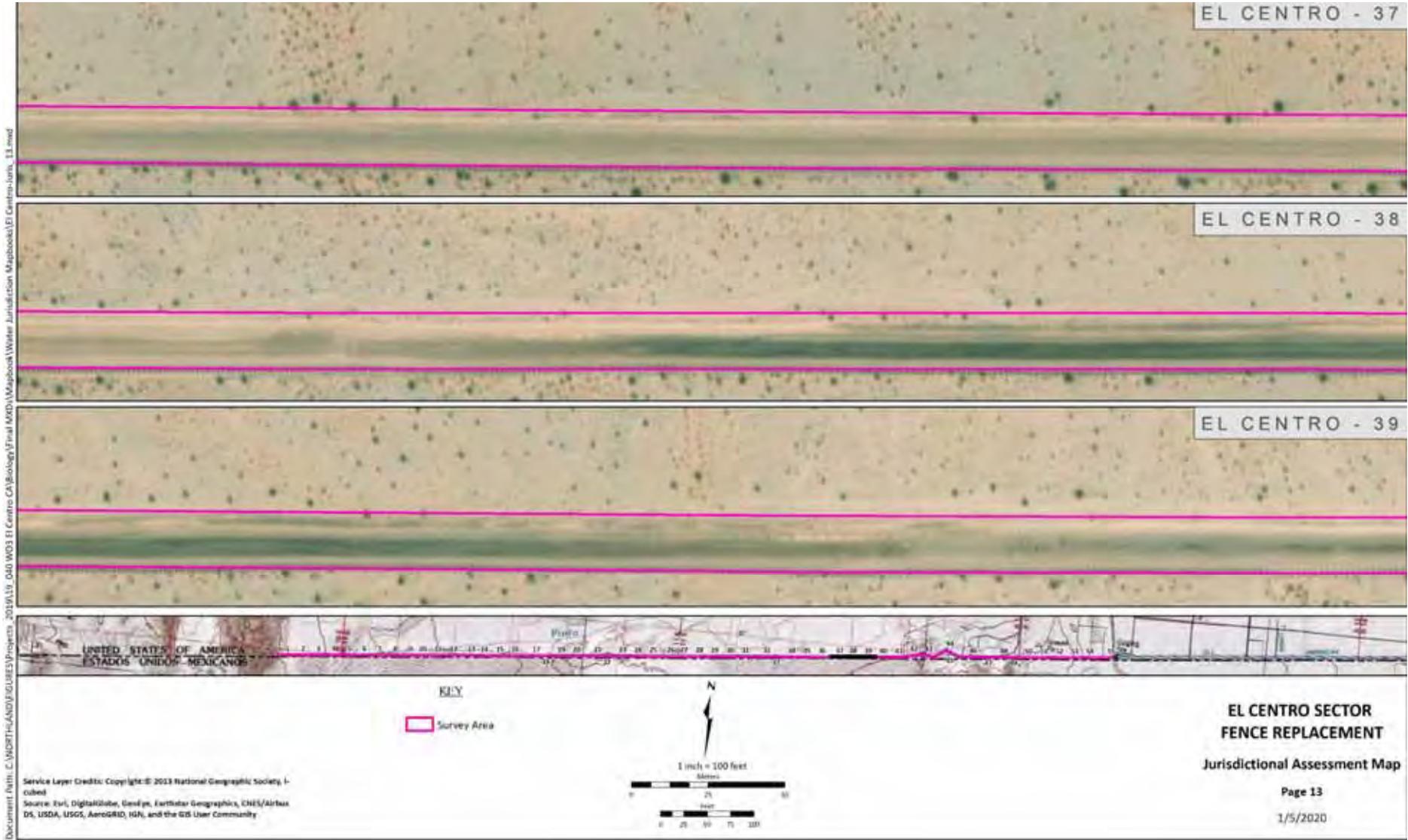


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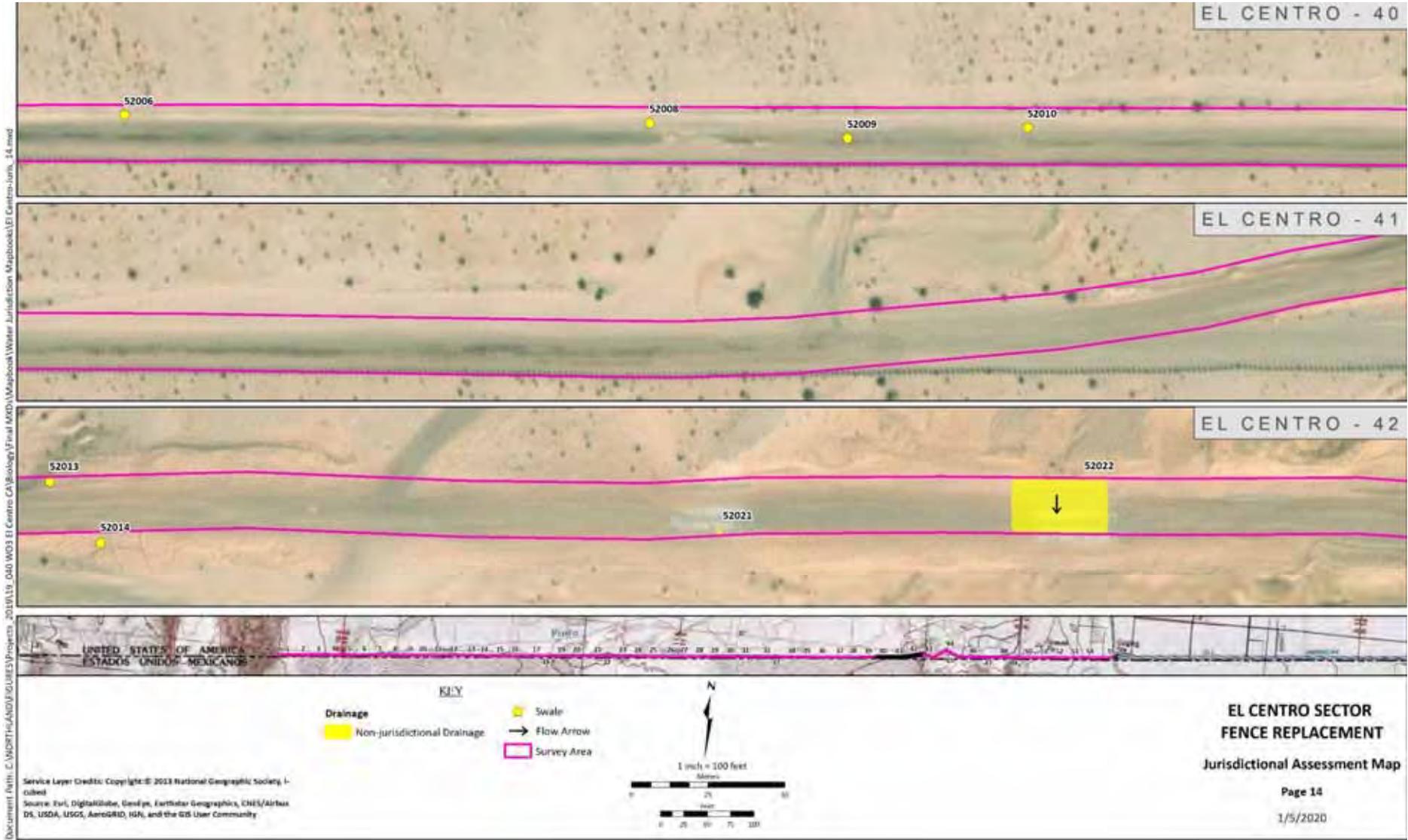


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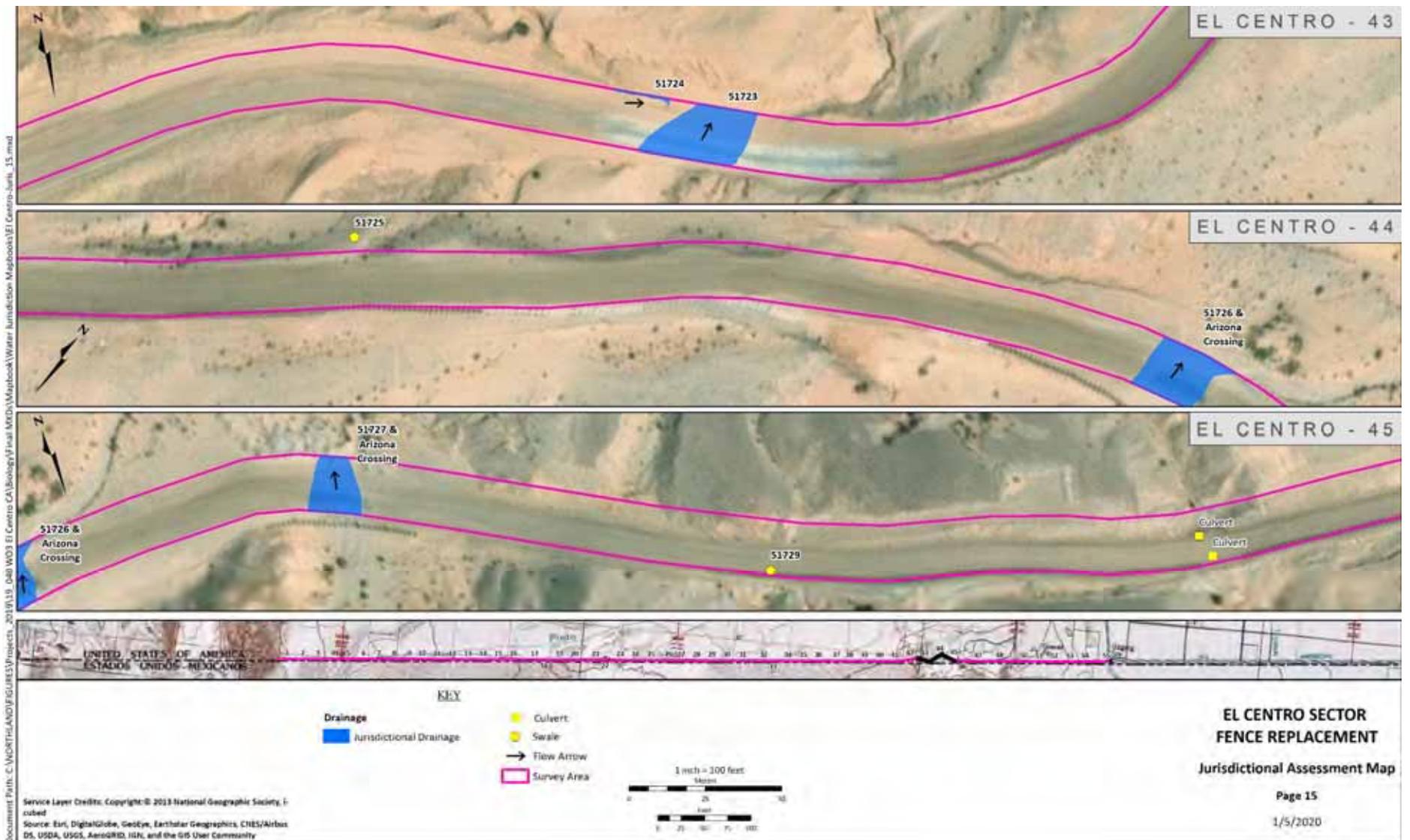


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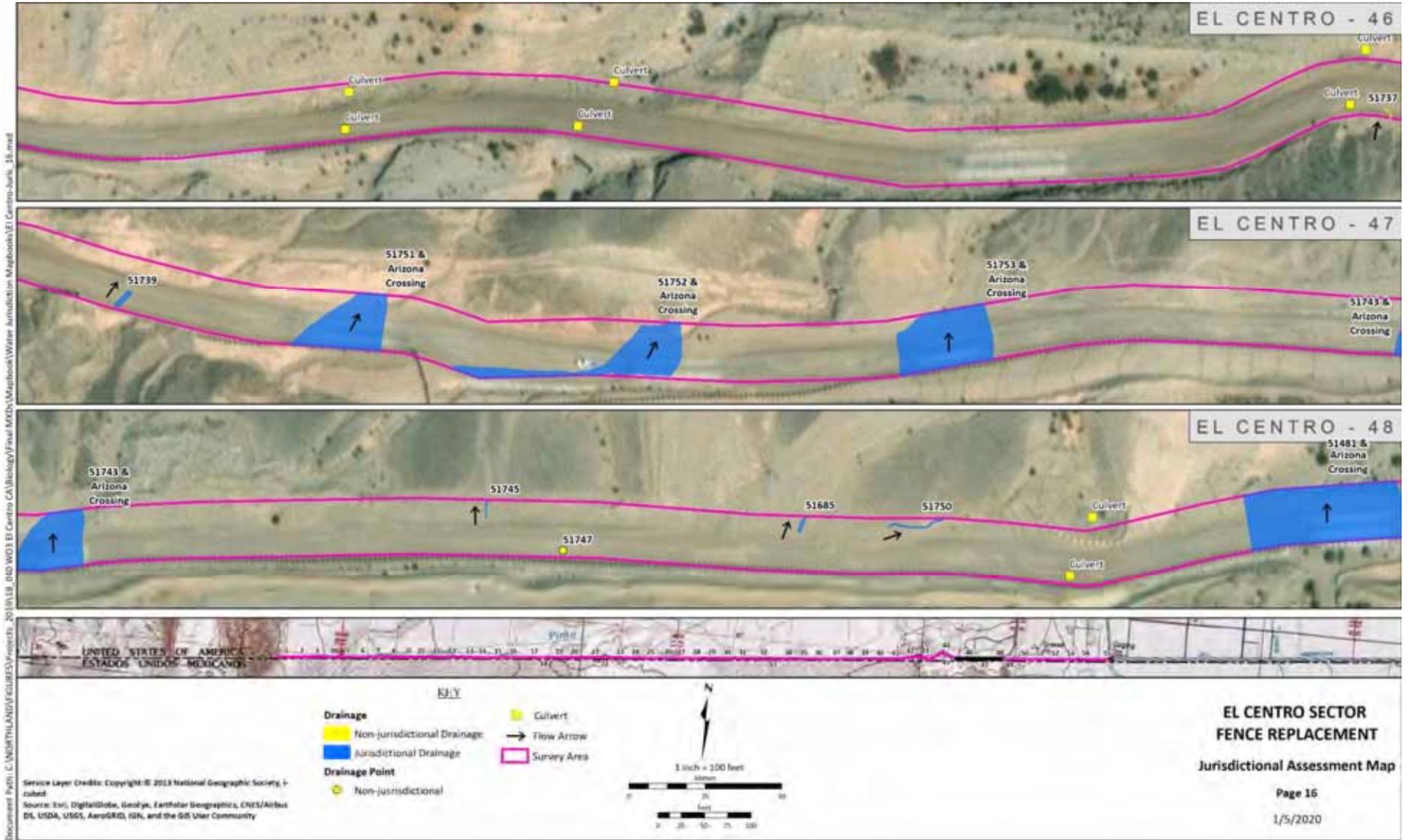


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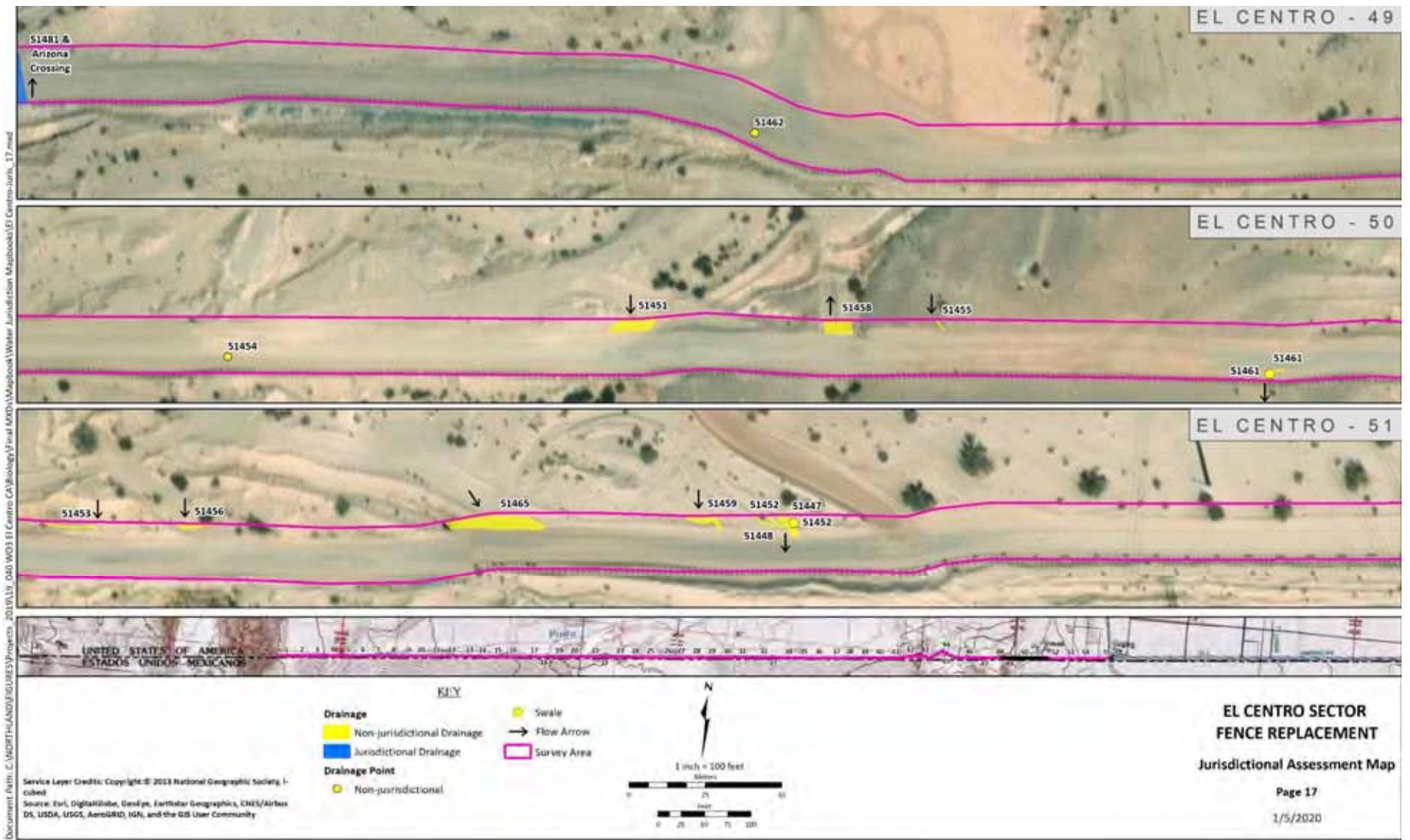


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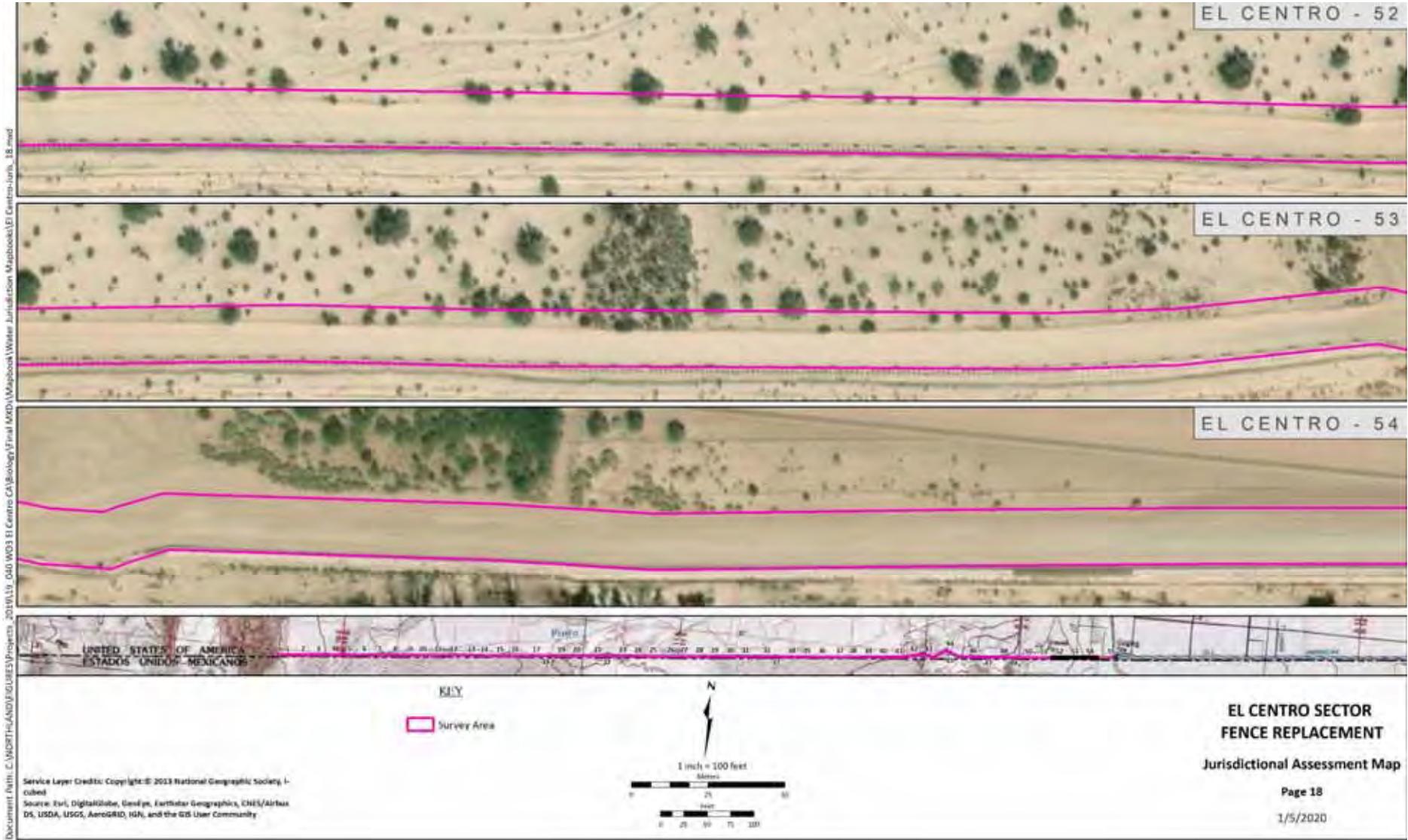


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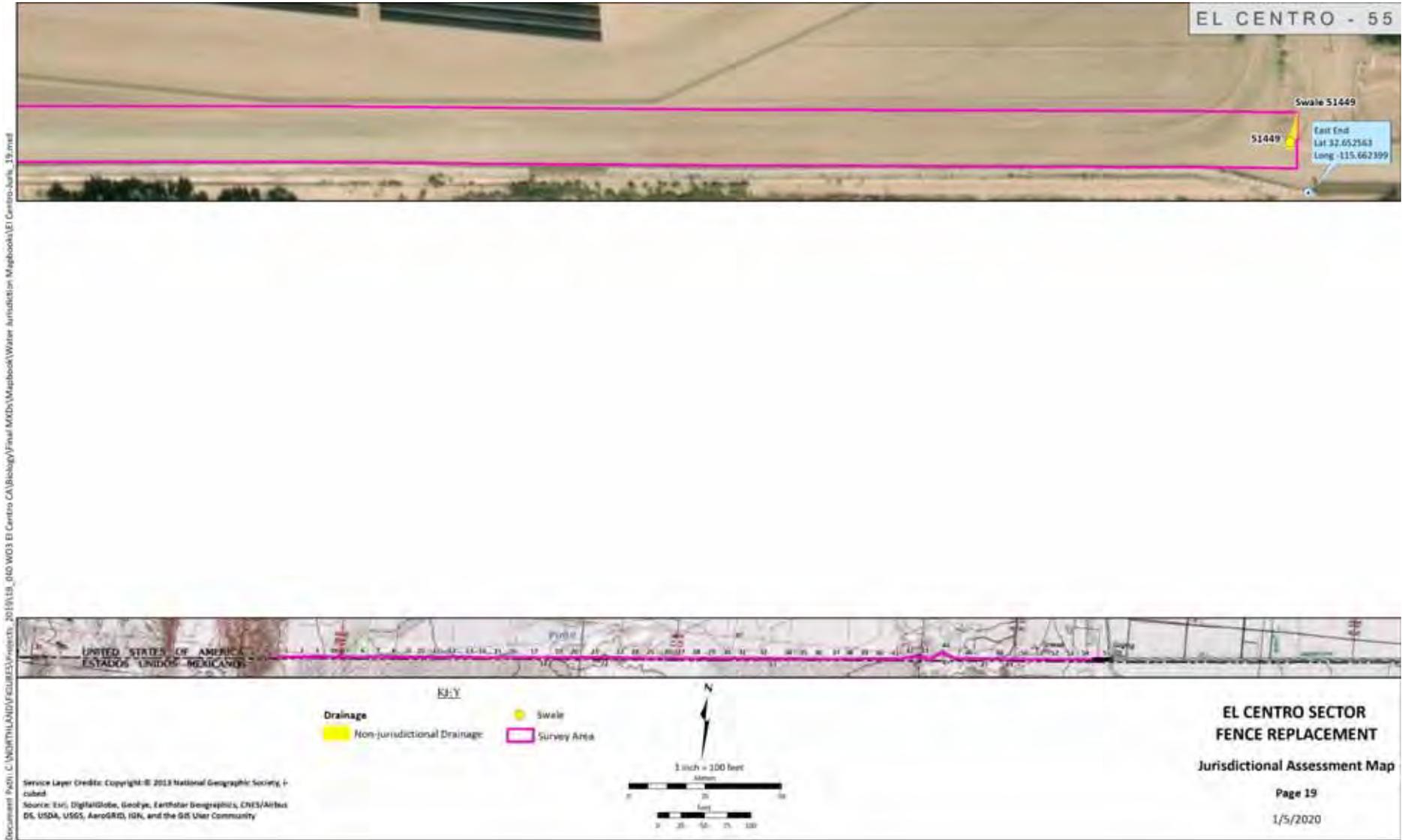


Figure 6

Figure 7: Soils Map

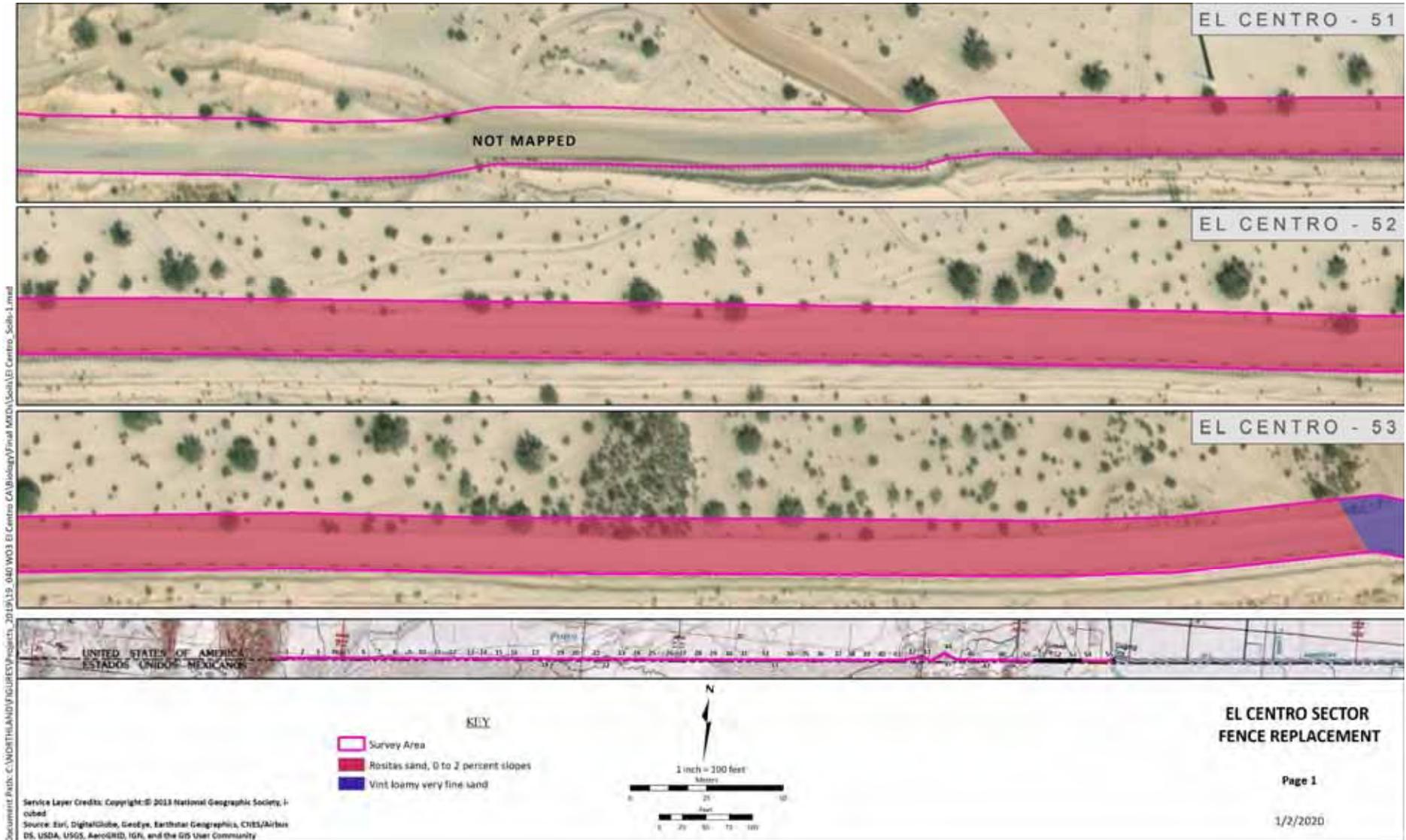


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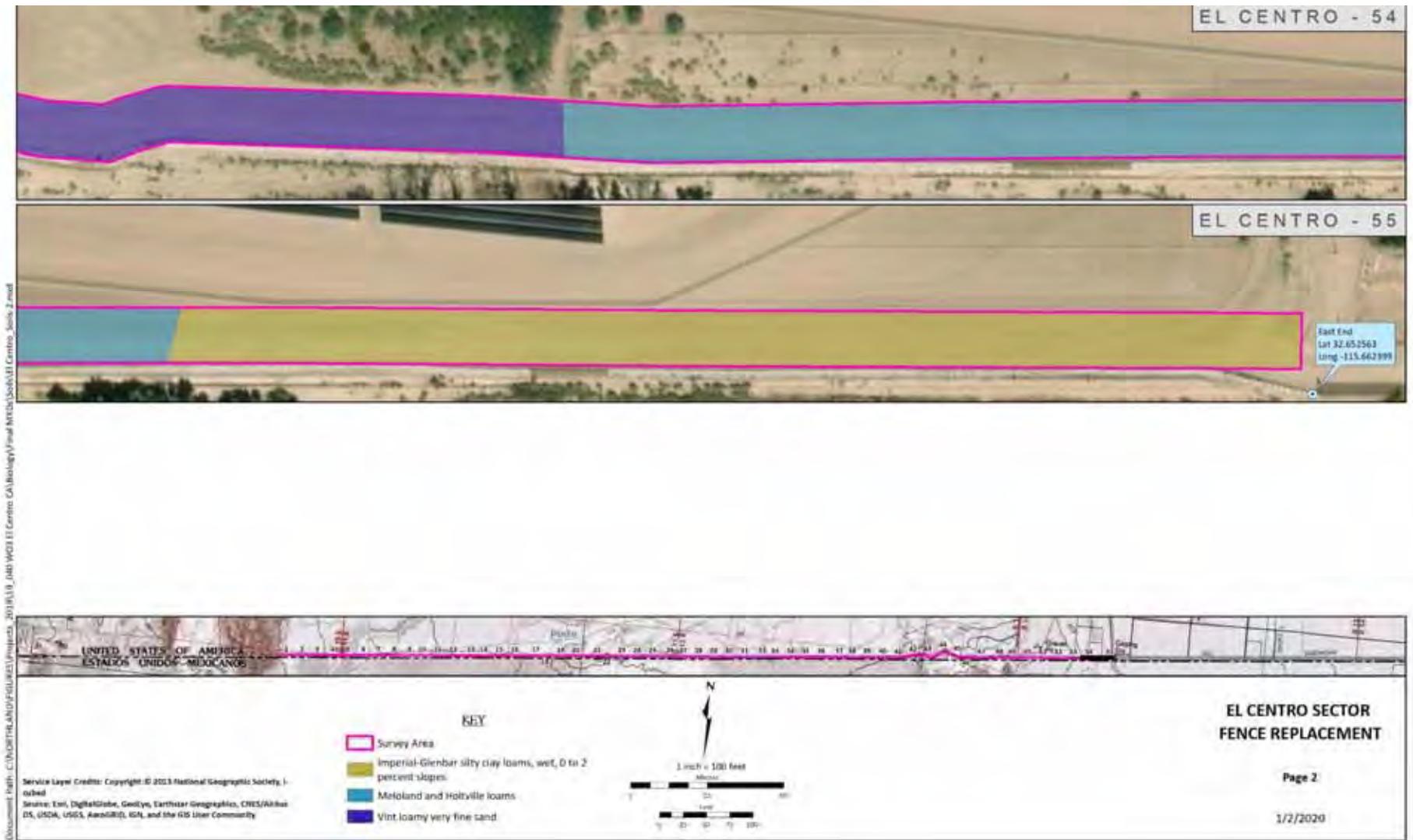


Figure 7

Appendix B:
Description of Special-Status Plant Species

High Potential

Harwood's milkvetch (*Astragalus insularis* var. *harwoodii*)

CRPR 2B.2

Harwood's milkvetch is an annual herb in the legume family (Fabaceae) that blooms from January to May. This decumbent to ascending herb is found in sandy or gravelly soils below 1,640 feet in desert dune and Mojavean desert scrub (Wojciechowski and Spellenberg 2012, CNPS 2019). It is rare in California but more common in other states and is ranked 2B.2 by the California Rare Plant Rank system. The “.2” designation suggests that this species is moderately threatened in California. Records of Harwood's milkvetch indicate that it is present in the western Yuha Desert (CNPS 2019). This species would not have been observable during surveys, but the sandy and gravelly soils preferred by Harwood's milkvetch in creosote dominated vegetation communities are present in the Survey Area.

Pink fairyduster (*Calliandra eriophylla*)

CRPR 2B.3

Pink fairyduster is a perennial deciduous shrub up to two feet in height in the legume family (Fabaceae) that blooms from January to March. It is found in sandy washes, slopes and mesas between 390 and 4,921 feet in Sonoran Desert scrub (Wojciechowski and McClintock 2012, CNPS 2019). This species is rare in California, but more common in other states and is ranked 2B.3 by the California Rare Plant Rank system. The “.3” designation suggests that this species is not very threatened in California. Records of this species indicate it is present in the Yuha Basin (CNPS 2019). This species was not observed during surveys, but the sandy washes and slopes in and adjacent to the Survey Area are suitable to support the presence of pink fairyduster.

Abrams' spurge (*Euphorbia abramsiana*)

CRPR 2B.2

Abrams' spurge is an annual herb in the spurge family (Euphorbiaceae) that blooms between September and November, sometimes blooming as early in the season as August. This prostrate herb is found on sandy flats below 656 feet in Sonoran and Mojavean Desert scrub (Keil et.al. 2012, CNPS 2019). It is rare in California but more common in other states and is ranked 2B.2 by the California Rare Plant Rank system. The “.2” designation suggests that this species is moderately threatened in California. Records indicate that this species is scattered throughout the Sonoran Desert ecoregion, including the western Yuha Desert (CNPS 2019). This species would not have been observable during surveys, but the presence of sandy soils throughout the Survey Area are suitable to support the presence of Abrams' spurge.

Baja California ipomopsis (*Ipomopsis effusa*)

CRPR 2B.1

Baja California ipomopsis is an annual herb in the phlox family (Polemoniaceae) that blooms from April to June. It is found in sandy soils and desert washes of Sonoran Desert scrub and chaparral below 328 feet (Wilken 2012, CNPS 2019). This species is rare in California but more common outside of the state (Mexico) and is ranked 2B.1 by the California Rare Plant Rank system. The “1” designation suggests that this species is seriously threatened in California. Records of this species indicate that it is known from one general area within the Yuha Basin (CNPS 2019). This species would not have been observable during surveys, but the sandy soils and desert washes present in the Survey Area are suitable to support Baja California ipomopsis.

Brown turbans (*Malperia tenuis*)

CRPR 2B.3

Brown turbans is an annual herb in the sunflower family (Asteraceae) that blooms between March and April, occasionally starting as early as February. This prostrate herb is found on sandy or gravelly soils in creosote dominated vegetation communities of Sonoran Desert scrub below 1,640 feet (Keil and Powell 2012, CNPS 2019). It is rare in California but more common in other states and is ranked 2B.3 by the California Rare Plant Rank system. The “.3” designation suggests that this species is not very threatened in California. Records show that this species is present along the western side of the Imperial Valley and adjacent to the Survey Area in the Yuha Desert (CNPS 2019). This species would not have been observable during surveys, but the sandy and gravelly soils and creosote dominated vegetation community in and adjacent to the Survey Area are suitable to support the presence of brown turbans.

Hairy stickleaf (*Mentzelia hirsutissima*)

CRPR 2B.3

Hairy stickleaf is an annual herb in the loasa family (Loasaceae) that blooms from March to May. It is found in desert washes, alluvial fans and slopes and creosote scrub vegetation communities below 2,363 feet (Brokaw et. al. 2012, CNPS 2019). This species is rare in California but more common outside of the state (Mexico) and is ranked 2B.3 by the California Rare Plant Rank system. The “.3” designation suggests that this species is not very threatened in California. Records of this species indicate that hairy stickleaf is present on the alluvial fans, slopes and washes along the eastern slopes of the Peninsular Range, including the Yuha Desert (CNPS 2019). This species would not have been observable during surveys for this project, but it has been documented to occur within the Survey Area by biologists in previous years. The presence of suitable desert washes and slopes, and prior observations of the species in this Survey Area suggests that hairy stickleaf is likely present.

Slender cottonheads (*Nemacaulis denudata* var. *gracilis*)

CRPR 2B.2

Slender cottonheads is an annual herb in the buckwheat family (Polygonaceae) that blooms from April to May, with some individuals blooming as early as March. It is found in coastal and desert dune habitats and Sonoran Desert scrub up to 1,640 feet (Reveal and Rosatti 2012, CNPS 2019). This species is rare in California but more common outside the state and is ranked 2B.2 by the California Rare Plant Rank system. The “.2” designation suggests that this species is moderately threatened in California. Records of slender cottonheads indicate that it has been observed at the western edge of the Yuha Desert (CNPS 2019, Calflora 2019). This species would not have been observable during surveys, but patches of wind-blown dune sands are present in and adjacent to the survey area and are suitable to support this species.

Roughstalk witch grass (*Panicum hirticaule* ssp. *hirticaule*)

CRPR 2B.1

Roughstalk witch grass is an annual herb in the grass family (Poaceae) that blooms between August and December. This species is found in sandy soils in creosote bush scrub below 4,593 feet (Freckmann and Webster 2012). It occurs in a wide variety of habitats, including desert dunes, Joshua tree woodland, and Mojavean and Sonoran Desert scrub (CNPS 2019). This species is rare in California but more common in other states and is ranked 2B.1 by the California Rare Plant Rank system. The “.1” designation suggests that this species is seriously threatened in California. Records

of this species are more common on the eastern side of the Imperial Valley, but records do indicate a presence in the western Yuha Desert (CNPS 2019). This species would not have been observable during surveys, but the sandy soils and creosote-dominated vegetation community suggests that there is a high potential for it to be present in or adjacent to the Survey Area

Moderate Potential

Parish's desert thorn (*Lycium parishii*)

CRPR 2B.3

Parish's desert thorn is a perennial shrub in the nightshade family (Solanaceae) that blooms from March to April. It can be found on sandy to rocky slopes and canyons in Coastal and Sonoran Desert scrub below 3,280 feet (Nee 2012). This species is rare in California but more common in other states and is ranked 2B.3 by the California Rare Plant Rank system. The “.3” designation suggests that this species is not very threatened in California. This species has been reported from several locations in the Yuha Basin (CNPS 2019, Calflora 2019) but was not observed during surveys. Rocky and sandy slopes and canyons occur in a few locations within and adjacent to the survey area, but the habitat is not widespread.

Dwarf germander (*Teucrium cubense ssp. depressum*)

CRPR 2B.2

Dwarf germander is an annual herb in the mint family (Lamiaceae) and blooms from March to May. Some individuals have been observed to bloom in September and November. Dwarf germander is found in sandy soils, including washes, fields and alkaline flats, below 1,312 feet. It occurs in desert dunes, at the margins of plays and in Sonoran Desert scrub vegetation (Miller and Wilken 2012, CNPS 2019). This species is rare in California but more common in other states and is ranked 2B.2 by the California Rare Plant Rank system. The “.2” designation suggests that this species is moderately threatened in California. Limited records of dwarf germander from the western Yuha Desert are known (CNPS 2019). This species would not have been observable during surveys. Dwarf germander can be found in sandy soils and desert washes which are present in the Survey Area, but additional habitats such as fields and alkaline flats are not present.

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Appendix C:
Description of Special-Status Wildlife Species

Federally Listed Species

Southwestern willow flycatcher (*Empidonax traillii extimus*)

Federal Endangered Species, California Endangered Species

All subspecies of willow flycatcher (*Empidonax traillii*) in California were listed as State endangered species in 1991 (CDFW 2019a). The southwestern willow flycatcher subspecies was listed as a Federal endangered species in 1995 (60 FR 10694). A revised critical habitat for the subspecies, including 1,975 drainage kilometers, was designated in 2013 (78 FR 344). No critical habitat has been designated in Imperial County.

The southwestern willow flycatcher is insectivorous, foraging on insects which catches in flight or it gleans off vegetation. It is migratory with a breeding range in the Southwest U.S and extreme Northern Mexico and a wintering range in Mexico, Central and possibly South America. The breeding range in the U.S. includes Arizona, New Mexico, and southern California, plus the extreme southern part of Nevada and Utah, and southwest Colorado.

Breeding habitat consists of dense riparian forests and thickets along rivers, swamps, lakes, or reservoirs. Historically, nesting occurred in willow (*Salix* sp.), mulefat (*Baccharis salicifolia*), boxelder (*Acer negundo*), buttonbush (*Cephalanthus occidentalis*) and cottonwood (*Populus fremontii*); however, as a result of alterations to riparian habitats, the southwestern willow flycatcher now includes tamarisk (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolia*) and mixed non-native vegetation stands of suitable structure to the list of vegetation suitable for nesting (USFWS 2019).

Limited habitat for the southwestern willow flycatcher is present around canals and agricultural fields to the east of the Survey Area, but these habitat fragments are small and degraded and are unlikely to support this species. This species has no potential to occur within the Survey Area.

Peninsular bighorn sheep (*Ovis canadensis nelsoni*)

Federal Endangered Species, California Endangered Species, BLM Sensitive Species

The Peninsular population of desert bighorn sheep was listed as a State Endangered Species in 1971 and as a Federal Endangered Species in 1998 (63 FR 13134). Bighorn sheep are split into three subspecies, two of which are present in California (*O.c. sierrae* and *O.c. nelsoni*). Desert bighorn (*O.c. nelsoni*) sheep are found throughout the rugged terrain of the Sonoran and Mojave Desert and associated mountain ranges. The Peninsular bighorn sheep (PBS) is a genetically isolated population of desert bighorns that inhabit the eastern slopes of the Peninsular Range from the Jacinto Mountains down south across the U.S. – Mexico border. This population is protected and managed separately from the larger Desert bighorn population.

Peninsular bighorn sheep in the Peninsular Range are found in steep, rough, rugged mountain terrain with sparse vegetation. They depend on their ability to detect predators at long range and then used their exceptional skill as climbers to escape (CDFW 2019b). The PBS will avoid areas with denser vegetation, like chaparral, because they cannot detect predators at a distance. The presence of water and forage is also important for PBS and they will seek these resources out in canyon bottoms, alluvial fans and sandy washes as well as on the rugged mountain slopes. Home range size varies from one area to another and depends on the relative positioning of forage, water and escape terrain. Male home ranges are larger than female home ranges. Peninsular bighorn sheep do not migrate but do show a seasonal change in habitat use with a concentration of activity around water sources in the summer. Peninsular bighorn sheep are active primarily during the day but can be active at any time of the day or night (CDFW 2019b).

Female PBS form groups of related individuals and spend much of their life in the same area where they were born. Males move between female groups during the breeding season. Most lambs in the Peninsular Range are born between January and June (CDFW 2019b). This species has high potential to occur as suitable habitat is present within the Survey Area throughout the western extent of the Project.

Present

Flat-tailed horned lizard (*Phrynosoma mcallii*)

CDFW Species of Special Concern, BLM Sensitive Species

The flat-tailed horned lizard is one of four species of horned lizards in California and has a range that extends into southwestern Arizona. It is designated as a Species of Special Concern by the CDFW, and a Sensitive Species by the BLM. Flat-tailed horned lizards are managed under a conservation agreement signed in 1997 and the principal species managers in California include the BLM, Department of the Navy, California Department of Parks and Recreation, Bureau of Reclamation and private individuals (Flat-tailed Horned Lizard Interagency Coordinating Committee 2003).

The flat-tailed horned lizard can be found in sandy desert hardpan and sparsely vegetated creosote (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). They are more frequent in areas where their primary food sources (harvester ants) are abundant and where there is loose fine sand to burrow and hide in. They co-occur with southern desert horned lizards (*Phrynosoma platyrhinos calidiarum*) in parts of their range (Jones and Lovich 2009, CalHerps, 2019a). The flat-tailed horned lizard is an insectivore, consuming primarily harvester ants in the Genera *Messor* and *Pogonomyrmex*. They are active in hot weather and do not aestivate in the Summer. They will use shallow burrows or shuffle into the loose sand to avoid extreme temperatures. Most adults will hibernate in shallow burrows between mid-November and emerge as early as mid-February (CalHerps 2019a, Muth and Fisher 1992). Some juveniles may remain active throughout the winter. Unlike other species of horned lizards, flat-tailed horned lizards do not squirt blood from its eyes as a defense (CalHerps 2019a, Jones and Lovich 2009).

This species of lizard is generally slow moving and avoids predation by burying itself in sandy substrates or relies on camouflage to remain concealed. These behaviors increase the likelihood of mortality events by vehicular strike. There is high potential for this species to occur across the entire Survey Area.

Loggerhead shrike (*Lanius ludovicianus*)

CDFW Species of Special Concern

The Loggerhead shrike is a year-round resident in California and can be found in a variety of habitats including desert scrub, grasslands, sage scrub, chaparral and suburban environments (Alderfer 2006, Unit 2004). It feeds on insects and arthropods and small vertebrates which it dispatches with its strong jaws and hooked bill. Shrikes hunt from an elevated perch or may hover over an area trying to startle out prey (The Cornell Lab 2019a). The shrike has a habit of taking large prey items and impaling them on a sharp branch, thorn, barbed wire or similar object, to save for a later meal, mark territory or to simply hold while they tear off bite-sized pieces (Unit 2004, The Cornell Lab 2019a). Another common name for this species is the “butcher bird”. Nests are built in densely leafed, often thorny shrubs or small trees where the leaf cover helps hide the nest and the thorns help to keep predators out. Nests are typically less than four feet above the ground. Five to six eggs are laid, and one or two broods are raised a year.

One loggerhead shrike was observed during the survey effort in the middle portion of the Survey Area and was perching on the vehicle barricade. There is high potential for this species to occur across the entire Survey Area.

High Potential

Barefoot banded gecko (*Coleonyx switaki switaki*)

California Threatened Species, CDFW Species of Special Concern, BLM Sensitive Species

The barefoot banded gecko is a small (up to 3.3 inches snout to vent) secretive lizard that inhabits arid rocky areas with large boulders and rock outcrops with sparse vegetation on the eastern slope of the Baja California Peninsular range (CalHerps 2019b, Jones and Lovich 2009). This nocturnal lizard is not often observed, and little is known about its natural history. It is known to feed on small invertebrates, including crickets, scorpions, spiders, moths and beetles. They spend the daylight hours hiding under rocks, in rock fissures, and small mammal burrows. At the approach of winter, the gecko seeks out mammal burrows in which to hibernate, returning to activity as early as January. Mating occurs May through July and up to three clutches of two eggs each are deposited into July. Young geckos hatch around August (Jones and Lovich 2009).

The barefoot banded gecko was listed as a California Threatened species in October of 1980 and is also a CDFW Species of Special Concern and BLM Sensitive Species. This species has high potential to occur as suitable habitat is present within the Survey Area throughout the rocky substrates within the western extent of the Project.

Colorado Desert fringe-toed lizard (*Uma notata*)

CDFW Species of Special Concern, BLM Sensitive Species

The Colorado Desert fringe-toed lizard occupies sparsely vegetated areas of fine wind-blown sand, including dunes, and hummocks around shrubs (CalHerps 2019c). The fine sand is a key habitat feature for this species (Jones and Lovich 2009). They burrow into the loose sand to escape predators and excessive desert heat and will sleep buried in sand under a shrub. This species has several adaptations for living in the fine sand, including a countersunk lower jaw, overlapping eyelids, flaps on their ears and nostrils and nasal passages that function as valves. A fringe of scales along the toes of the hind feet enable them to move swiftly across the loose, unstable substrate. They are active from February to November, and spend the cooler months buried up to 11 inches in sandy burrows (Jones and Lovich 2009). A clutch of up to 5 eggs (2 average) are laid between May and August. Hatchlings appear about two months later. Juvenile lizards may stay active longer into the season before going dormant and become active earlier. The Colorado Desert fringe-toed lizard feeds primarily on insects, including ants, beetles, moths, grasshoppers, sand roaches, spiders and caterpillars. They will also eat some flowers, buds, leaves and seeds of some desert plants (Jones and Lovich 2009). Predators include snakes, birds and medium sized mammals. This species has high potential to occur as suitable habitat is present throughout the Survey Area.

Burrowing Owl (*Athene cunicularia*)

CDFW Species of Special Concern

BLM Sensitive Species

Burrowing owls are migratory over much of their range, and in southern California where they can be found throughout the year, there is still considerable movement between summer breeding sites and over-wintering sites (Unit 2004). In Imperial County, this species is more common during the summer months (Unit 2004). Burrowing owls prefer open areas with low, sparse shrub cover in rolling terrain.

They can be found on golf courses, pastures, agricultural fields, deserts habitats and other areas that are managed in an open state, like airport medians and surrounding lands (The Cornell Lab 2019). Burrowing owls use the burrows of other burrowing animals, like ground squirrels (*Otospermophilus beecheyi*), and desert tortoises (*Gopherus agassizii*). They are predominantly nocturnal, like most owls, but during the day they can be seen perched at the entrance to their burrow or on another nearby prominent post or lookout (Alderfer 2006). At night they forage on large insects and small vertebrates, including grasshoppers, crickets, beetles, moths, mice, voles and shrews. Other species may be taken where available. Nesting burrows may be several yards long, but usually less than 3 feet in depth. They are modified and enlarged from the original burrow excavated by another animal. In unusual cases, burrowing owls in the west will dig their own burrows. This is more prevalent in other populations (The Cornell Lab 2019).

Burrowing owl populations are on the decline across their North American range and for a variety of reasons; however, the primary cause of the decline has not been isolated. Few breeding pairs are left in San Diego County, but more are still present in Imperial County CA (Unit 2014). This species has high potential to occur as suitable habitat is present throughout the Survey Area.

Prairie falcon (*Falco mexicanus*)

CDFW Watch List

The prairie falcon is distributed across Western North America, just into Southern Canada and Mexico. It is an inhabitant of foothills, grasslands, desert and open country where bluffs and rock outcroppings are present for nesting (Unit 2004). Most of the population is migratory, moving from distinct wintering grounds to breeding grounds in the spring; but the California population appears to be more resident year-round (The Cornell Lab 2019). Prairie falcon prey on small mammals in the summer in addition to birds which they catch while flying (Alderfer 2006, The Cornell Lab 2019). Ground squirrels, doves and shorebirds are common in the diet of Prairie falcons. Nests are found in rock crevices, potholes, ledges or steep bluffs, generally protected by an overhang. Prairie falcons are also known to nest in trees, powerline towers, caves, quarries, buildings, and abandoned nests of other raptors and ravens (The Cornell Lab 2019). One clutch of 2 to 6 eggs are laid each year.

In the Survey Area, suitable nesting habitat is present in the rugged terrain to the west (CNDDDB 2019). Suitable avian prey species were observed throughout the Survey Area, so prairie falcons may use the Survey Area and adjacent areas to forage.

Black-tailed gnatcatcher (*Polioptila melanura*)

CDFW Watch List

The black-tailed gnatcatcher is a small songbird of the desert thorn scrub and washes. They prefer areas dominated by creosote (*Larrea tridentata*), saltbush (*Atriplex* sp.), mesquite (*Prosopis* sp.), palo verde (*Parkinsonia aculeata*), ocotillo (*Fouquieria splendens*), and some cactus (*Carnegiea gigantea*, *Opuntia* sp., *Cylindropuntia* sp. and *Ferocactus* sp.) (The Cornell Lab 2019). They are adapted for the desert environment and can survive in habitats with less than 8 inches of annual precipitation. They feed by gleaning insects off leaves and supplement their diet with fruit or seeds. They are year-round residents throughout their range and do not migrate. They nest in spiny trees and shrubs, including smoketrees (*Psoralea argophylla*), paloverde and mesquite (Unit 2004, The Cornell Lab 2019). One to two broods are raised a year with 3 to 5 eggs per clutch. This species is numerous, but populations are in decline. They do not tolerate disturbance well and do not readily adapt to non-native vegetation (The Cornell Lab 2019). This species has high potential to occur as suitable habitat for nesting and forage is present throughout the Survey Area.

Western mastiff bat (*Eumops perotis californicus*)

CDFW Species of Special Concern, BLM Sensitive Species

The western mastiff bat is North America's largest bat species with a wingspan of 20 to 22 inches. Roost sites are found in rugged, rocky canyons or cliff faces where the bats roost in rock crevices, or exfoliating slabs of granite. Suitable roosting crevices allow the bats to drop down vertically at least 6 feet into flight (Pierson 2005). Maternity colonies typically number fewer than 100 individuals, and unlike many bat species, they may contain male bats in addition to females and their young.

Mastiff bats are high and fast flyers foraging over long distances and a variety of habitats, sometimes regularly commuting over 18 miles (Hoffmeister 1986). They forage primarily on large moths, but will also consume beetles, crickets and katydid. Mastiff bats have an echolocation call that is audible to the human ear and is easily recognized. In San Diego County, mastiff bats do not hibernate for extended periods and makes seasonal movements depending on the climate (Stokes 2017). That behavior likely extends to mastiff bats in Imperial County. A dead specimen of this species was recovered from inside a CBP camera tower on "BP Hill" in the Yuha Basin in 2012 (D. Janeke, Biologist, Bio-Studies, personal communication). This species has high potential to occur as suitable habitat for is present throughout the Survey Area.

Pocketed free-tailed bat (*Nyctinomops femorosaccus*)

CDFW Species of Special Concern

The pocketed free-tailed bat is found in the arid regions of the southwestern U.S. where they roost in crevices and fissures in rocky cliffs, canyons and outcrops. Colonies are typically small, with fewer than 100 individuals. Pocketed free-tails are likely year-round residents in Imperial County like they are in San Diego County (Stokes 2017), making seasonal movements among roost sites depending on the seasonal temperatures.

Swift flyers, pocketed free-tails target moths as their most frequent food source but will also take beetles, flying ants, flies, leafhoppers, crickets, stinkbugs, lacewings and grasshoppers (Harvey et.al. 2011). This species has high potential to occur as suitable habitat for is present throughout the Survey Area.

Big free-tailed bat (*Nyctinomops macrotis*)

CDFW Species of Special Concern

The big free-tailed bat can be distinguished from its contemporary free-tail species, the pocketed and the Mexican free-tailed bats, by its larger size while still being considerably smaller than the mastiff bat. They are found in the rocky arid parts of the Southwest U.S. where they roost in rock crevices high on cliff faces, canyon walls and rocky outcrops, while foraging over a variety of habitats, including desert shrub, woodlands, grasslands and evergreen forests (WBWG 2019, Harvey et.al. 2011). Maternity roosts form in rock crevices as well and may be used repeatedly over the years (WBWG 2019). Big free-tail bats do not hibernate, and with the northern part of their range extending into Utah and Colorado, these populations are believed to be migratory (Harvey et.al. 2011). In San Diego County, Drew Stokes suggests this species is only present during the Fall and Winter seasons (Stokes 2017).

Big free-tail bats forage primarily on large moths, but will also take grasshoppers, beetles, crickets, leafhoppers and flying ants (WBWG 2019). Like the mastiff bat, the big free-tailed bat has an echolocation call that falls within the audible range for people with normal hearing abilities. This species has high potential to occur as suitable habitat for is present throughout the Survey Area.

Moderate Potential

Golden Eagle (*Aquila chrysaetos*)

CDFW Fully Protected Species, CDFW Watch List, Federal Bald and Golden Eagle Protection Act

The golden eagle is large raptor of open and semi open areas that tends to avoid areas of contiguous forest. Found through Europe, Asia and North America, they are primarily distributed in the western areas of North America up into Canada and Alaska, and down into Mexico. Occurrences of golden eagles in the eastern areas of North America are scarce or occur during migration (The Cornell Lab 2019b). They build large nests on cliffs or mature trees and on man-made structures in areas surrounded by grassland, chaparral, shrubland, forest and other vegetation types (The Cornell Lab 2019b). Golden eagles feed on a variety of medium-sized vertebrates, including ground squirrel, rabbits (*Sylvilagus* sp., *Lepus* sp.), prairie dogs (*Cynomys* sp.), marmots (*Marmota* sp.), snakes (*Pituophis* sp.) and similar species, and will also scavenge larger carcasses.

Historic records of golden eagles nesting in the rugged mountains to the west of the Survey Area are documented (Unit 2004), however, nearest occupied golden eagle territory north of the U.S./Mexico international border is 13 miles to the west at Table Mountain. This species has moderate potential to occur as suitable habitat to support foraging for is present throughout the Survey Area.

Ferruginous hawk (*Buteo regalis*)

CDFW Watch List

The ferruginous hawk is a large raptor of open areas, including grasslands, sagebrush, saltbush-greasewood shrublands, and the edges of pinyon-juniper forests. The diet of the ferruginous hawk consists of small mammals, including rabbits (*Sylvilagus* sp., *Lepus* sp.), ground squirrels, prairie dogs (*Cynomys* sp.) and gophers (Family: Geomyidae). Other prey, including reptiles, amphibians and insects may be consumed when available (The Cornell Lab 2019). They will hunt from a perch, while flying or while standing on the ground. Ferruginous hawks have been recorded nesting in isolated trees, cliffs, utility structures, rock outcrops, or on the ground on slopes or hill crests. In Southern California, the ferruginous hawk is a winter visitor and may be found roosting and hunting in small groups (The Cornell Lab 2019, Unit 2004).

In the Survey Area, ferruginous hawks may be encountered as individuals or small groups during the winter months. It is possible they could be encountered hunting along the entire Survey Area, but they are more likely to be encountered on the east end of the Survey Area closer to agricultural lands where rabbits and ground squirrels may be more abundant. This species has moderate potential to occur as suitable habitat to support foraging for is present throughout the Survey Area.

Swainson's hawk (*Buteo swainsoni*)

California Threatened Species, BLM Sensitive Species

The Swainson's hawk is a long-distance migratory raptor, spending summers in the western half of North America up into Canada and Alaska, then migrating south to Central and South America with some individuals overwintering in Argentina (The Cornell Lab 2019). Once a common nesting species in Southern California, breeding has been forced into habitats north of Southern California. The deserts areas of eastern San Diego County and Imperial County; however, remain an important area for groups of Swainson's hawks migrating north. The Swainson's hawk feeds primarily on small mammals and insects but will also take reptiles and birds when available. Historic habitat for Swainson's hawks is open prairie grassland habitat. Much of that historic habitat has been converted to other uses, but they have adapted to agricultural settings and can be found hunting in hay fields,

row crops, pastures and grain crops. Swainson's hawks hunt from a perch, either a fencepost along the edge of a field, or from overhead sprinklers as they move slowly across a field. Nesting occurs in scattered trees in and around fields.

In the Survey Area, Swainson's hawks are most likely to be encountered when large flocks move north during the spring. They may stop to feed on rodents or insects in the Survey Area but are not expected to nest. This species has moderate potential to occur as suitable habitat to support foraging for is present throughout the Survey Area.

Mountain plover (*Charadrius montanus*)

CDFW Species of Special Concern, BLM Sensitive

The mountain plover is a winter visitor to Central and Southern California, Southern Arizona, and Northern Mexico, and breeds in the open prairies of the central U.S. (Alderfer 2006, The Cornell Lab 2019). In its wintering territory, it can be found on short grass plains, fallow and planted fields, bare dirt field, and sandy deserts. It feeds on insects.

This species is uncommon and one of North America's most seriously threatened birds (Unit 2004). Population declines are due to habitat changes in its Great Plains breeding and intermountain plateau breeding habitat. This species has been observed 6.5 miles north of the Survey Area in agricultural fields to the east end of the Survey Area (CNDDDB 2019). Most reported observations in Imperial County are from agricultural habitats and from sandy flats by the Salton Sea (CNDDDB 2019). In addition to agricultural fields near the east end of the Survey Area, this species may use wide flat patrol roads and adjacent sandy desert basin habitat as overwintering habitat. This species has moderate potential to occur as suitable habitat for overwintering is present throughout the Survey Area.

LeConte's thrasher (*Toxostoma lecontei*)

CDFW Species of Special Concern

LeConte's thrasher is well-adapted to desert life, inhabiting desert scrub, mesquite, riparian brush and chaparral vegetation communities. It prefers desert washes and sandy terrain (The Cornell Lab 2019, Unit 2004) where it forages along the ground for insects, spiders and some seeds and berries. It is known to run across the sparsely vegetated desert sand, taking flight when startled. It has also been observed to dig holes in search of arthropods (The Cornell Lab 2019). LeConte's thrasher is a year-round resident in the desert areas of Imperial County. Nests are built in thorny desert shrubs or cholla (*Cylindropuntia* sp.) and one clutch of 2 to 5 eggs are laid.

LeConte's thrasher is not a common species, but observations have been reported 3.5 miles north of the Survey Area. Preferred sandy wash habitat, particularly at Pinto Wash at the western end of the Survey Area are suitable for this species. This species has moderate potential to occur as suitable habitat to support nesting and forage for is present within the western portion of the Survey Area.

Pallid bat (*Antrozous pallidus*)

CDFW Species of Special Concern, BLM Sensitive

The pallid bat is distributed throughout the southwest and western U.S. and is most common in arid regions (Harvey et.al. 2011). They day-roost in small groups of less than 20 individuals in crevices on rocky outcrops, caves, mines, tree cavities, buildings and bridges. They are also known to gather at night-roosts separate from their day-roosting site between bouts of foraging. Day-roosts are sometimes as much as 3 miles from a drinking water source (Stokes 2017). Pallid bats do not migrate significant

distances but will move from summer roosts to winter roost sites. Winter habits are poorly understood (WBWG 2019).

Pallid bats are insectivores and feed on large moths and a variety of large arthropods, including scorpions, crickets, solpugids, darkling beetles, centipedes, Jerusalem crickets, mantids, cicadas and longhorn beetles. Pallid bats are agile on the ground and many of these food items are captured from on the ground rather than from flight. The Pallid bat's echolocation is not audible to the human ear, but social calls made near the roost or occasionally when foraging are audible. This species has moderate potential to occur as suitable habitat for is present throughout the Survey Area.

Pallid San Diego pocket mouse (*Chaetodipus fallax pallidus*)

CDFW Species of Special Concern

The Pallid San Diego pocket mouse is one of two subspecies of San Diego pocket mouse in the region. In southern California, the northwestern San Diego pocket mouse (*C.f. fallax*) is found from the mountains (6,020 feet elevation, San Bernardino Mountains) to the coast, while the pallid San Diego pocket mouse is a more arid form found on the eastern slopes of the Peninsular Range and into the western Sonoran and Mojave Deserts (CNDDDB 2019, Lackey 1996). They prefer rocky terrain in a variety of habitats including flood plains and desert slopes (Lackey 1996) often associated with Yucca species (Jameson and Peeters, 2004). This pocket mouse lives a solitary nocturnal life and is primarily a seedeater feeding on the seeds of shrubs in its habitat at night. Those seeds are eaten or stored in grain larders within the individual's burrow system. San Diego pocket mice do not hibernate, but are able to torpor daily, and that is likely important in conserving energy and surviving periods drought (Tremor 2017a). This species has moderate potential to occur as suitable habitat for is present throughout the Survey Area.

Townsend's big-eared bat (*Corynorhinus townsendii*)

CDFW Species of Special Concern, BLM Sensitive

The Townsend's big-eared bat is considered an obligate cave-roosting species (Stokes 2017) and the current distribution of the species is concentrated around areas of cave-forming rock and historic mining areas (WBWG 2019). While preferring cave and mine habitats, it has been known to roost in buildings or tree hollows. Maternity colonies consisting of females and young form in early Spring with the exact timing dependent on the local climate and latitude. Males roost individually during the maternity season. Townsend's big-eared bats will hibernate and may move from summer roosts to winter roosts with a suitable temperature profile (Harvey et.al. 2011).

Townsend's big-eared bats are considered moth-specialists with moths comprising over 90 percent of their diet (WBWG 2019, Harvey et.al. 2011). They forage in edge habitats along streams and along and within wooded habitats. Foraging distances of over 93 miles in an evening have been reported (WBWG 2019). This species has moderate potential to occur as suitable habitat for is present throughout the Survey Area.

Western yellow bat (*Lasiurus xanthinus*)

CDFW Species of Special Concern

Western yellow bats are foliage-roosting bats and can be found roosting singly in cottonwood (*Populus fremontii*), sycamore (*Plantanus racemosa*), and in the dead palm skirts of native and non-native palm trees (*Washingtonia* sp.). Western yellow bats are unlikely to hibernate and may migrate in some portions of their range (WBWG 2019).

Western yellow bats are insectivores and forage on a wide range of insects, frequently around natural or non-natural water features in scrub, canyon, riparian, urban, and agricultural habitats. Due to the prevalence of untrimmed palm trees in urban landscaping, this species may be increasing its range in the U.S. the CNDDDB reports several occurrences of western yellow bat in the Imperial Valley area (CNDDDB 2019). This species has moderate potential to occur as suitable habitat for is present throughout the Survey Area.

California leaf-nosed bat (*Macrotus californicus*)

CDFW Species of Special Concern, BLM Sensitive Species

The California leaf-nosed bat is a resident of the desert lowlands in the Southwest U.S. They roost during the daytime in warm caves, mines and buildings (WBWG 2019). During the night, they will use shallow caves or short mine prospects, porches, bridges, open buildings or and mines as night roosts (Harvey et.al. 2011). They roost singly or in colonies of up to several hundred. California leaf-nosed bats do not migrate or hibernate and is not able to lower its body temperature to torpor (WBWG 2019), so roost site selection is critical for this species, particularly in the temperate desert winters. The universal feature of California leaf-nose bat winter roosts is warmth, high humidity and no air circulation (WBWG 2019). Maternity colonies of 100 to 200 bats are reported, sometime within the same roosts (e.g. mines) as used in winter, but in a different location, or different roost sites. Maternity colonies are predominantly female and juveniles, and large all-male roosts also form (WBWG 2019).

The California leaf-nosed bat diet consists of grasshoppers, cicadas, moths, caterpillars and beetles. The inedible remains of these meals can be found piled up under night roost sites (Harvey et.al. 2011). Foraging occurs by flying slowly around vegetation in desert wash habitats within about six miles of the roost site, picking insects off the vegetation or ground rather than chasing flying insects. This species has moderate potential to occur as suitable habitat for is present throughout the Survey Area.

Yuma myotis (*Myotis yumanensis*)

BLM Sensitive Species

Yuma myotis are a small, wide-spread western bat species that is typically associated with permanent bodies of water, including streams, lakes, rivers, canals or in more arid habitats, seeps and springs (Harvey et.al. 2011, WBWG 2019). Roosts are found in bridges, buildings, cliff crevices, caves, mines, trees, and artificial bat houses (WBWG 2019). This species forms large maternity roosts mid-Spring, some roosts in excess of 1,000 individuals have been reported (Stokes 2017, WBWG 2019). Males roost singly during the maternity season (Stokes 2017, WBWG 2019)

Yuma myotis travel on average of 1.2 miles from roosts to feed on insects that are captured on the wing over a water body. Insects consumed by Yuma myotis include caddis flies, flies, midges, moths, and small beetles. This species has moderate potential to occur as suitable habitat for is present throughout the Survey Area.

Palm Springs little pocket mouse (*Perognathus longimembris bangsi*)

CDFW Species of Special Concern, BLM Sensitive Species

The little pocket mouse is the smallest mammal in California, with 16 recognized subspecies, four of which occur in California. Three of these subspecies are desert forms, including the Palm Springs little pocket mouse. The Palm Springs little pocket mouse is known from the Coachella Valley south to Ocotillo, California. It is found in moderately dense to sparse creosote scrub, desert scrub, and grassland vegetation communities on loosely packed or sandy soil (Brylski 1998). In the Coachella Valley, it was found to be most abundant on gentle sandy slopes dominated by creosote (*Larrea*

tridentata), brittlebush (*Encelia farinosa*), white bursage (*Ambrosia dumosa*), and desert tea (*Ephedra californica*) (Dodd 1996 in Brylski 1998). The little pocket mouse hibernates/becomes torpid in winter and will rouse periodically to feed on cached seeds. They are typically not found active above ground between October and March, but unusual winter activity has been documented (Brylski 1998). Pocket mice are primarily seed eaters but will eat vegetation in the spring when its available. This species has moderate potential to occur as suitable habitat for is present throughout the Survey Area.

Yuma hispid cotton rat (*Sigmodon hispidus eremicus*)

CDFW Species of Special Concern

The Yuma hispid cotton rat inhabits brushy and weedy areas along rivers, sloughs, marshes and similar areas in arrow weed (*Pluchea sericea*), cattails (*Typha* sp.), common reed (*Phragmites australis*), irrigated fields, Bermuda grass fields and field edges with tall grass (NatureServe 2019). They feed on more vegetation, including grasses and forbs, than most native rodents and will also consume some insects as well (Jameson and Peeters 2004). They are active both day and night and make tunnels or runways through denser areas of grass. Historic occurrences are documented 4.5 miles north of the Survey Area in irrigation canal habitat (CNDDDB 2019). This species has moderate potential to occur as suitable habitat for is present within the eastern portion of the Survey Area.

American badger (*Taxidea taxus*)

CDFW Species of Special Concern

The American badger is a semi-fossorial predator in the weasel family (Mustelidae). Widely distributed across Central and Western North America, they inhabit open areas of grasslands, plains, prairies, alluvial fans, meadows and deserts (Jameson and Peeters 2004, Reid 2006). American badgers are well adapted for digging, possessing strong forelimbs, long claws, and a flattened body. They dig burrows which are used for resting, raising young and storing food. Several burrows are dug throughout their territory and the badger will periodically move between them. The primary food sources are ground squirrels and other burrowing rodents, but they will also take invertebrates, birds, reptiles, eggs and carrion. They are primarily nocturnal but will remain active into the crepuscular periods. One common badger hunting technique involves collapsing all but one burrow in a rodent complex, then excavating the remaining entrance until the target animal is reached. Red-tailed hawks (*Buteo jamaicensis*) and coyotes (*Canis latrans*) will sometimes attend hunting American badgers, snatching escaping squirrel and rodents as burrows are excavated (Jameson and Peeters 2004). The American badger is threatened by loss of habitat through urbanization, control of their ground squirrel food sources through poisons, and roadkill along highways (NatureServe 2019). Historic observations of American badgers near the Survey Area are old and date back to the early-to-mid-1900s (CNDDDB 2019). Despite the lack of recent documented observations, suitable habitat and food sources are present within and adjacent to the Survey Area. This species has moderate potential to occur as suitable habitat for is present throughout the Survey Area.

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Appendix D:
Table of Potential Special-Status Plant Species

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
MONOCOTS			
Poaceae – Grass family			
<i>Panicum hirticaule</i> ssp. <i>hirticaule</i> Roughstalk witch grass	CRPR 2B.1	Annual grass found at open sites with sandy soils in creosote bush scrub below 4,593 feet. Occurs in desert dunes, Joshua tree woodland, and Mojavean and Sonoran Desert scrub. Blooms August to December.	High Potential Roughstalk witch grass is found in sandy and silty soils in desert dune and Sonoran Desert scrub habitats dominated by creosote bush. Suitable soils and vegetation communities are present in the Survey Area.
EUDICOTS			
Asteraceae - Sunflower family			
<i>Malperia tenuis</i> Brown turbans	CRPR 2B.3	Annual prostrate herb found on sandy or gravelly soils in creosote bush scrub below 1,640 feet. Primary bloom period is March to April.	High Potential Brown turbans is associated with sandy and gravelly soils in creosote-dominated communities of Sonoran Desert scrub. The survey area contains suitable soils and vegetation communities to support this species.
Euphorbiaceae – Spurge family			
<i>Euphorbia abramsiana</i> Abrams' spurge	CRPR 2B.2	Annual prostrate herb found on sandy flats below 656 feet. Occurs in Mojavean and Sonoran Desert scrub. Blooms September to November.	High Potential Abrams' spurge is found on sandy flats in Sonoran Desert scrub. Soils capable of supporting this species are found in several locations in the Survey Area.
Fabaceae - Legume family			
<i>Astragalus insularis</i> var. <i>harwoodii</i> Harwood's milkvetch	CRPR 2B.2	Decumbent to ascending annual herb found in sandy or gravelly soils below 1,640 feet. Occurs in desert dunes and Mojavean desert scrub. Blooms from January to May.	High Potential Harwood's milkvetch is associated with sandy or gravelly soils in desert dune habitats and in creosote dominated vegetation communities. Suitable soils to support this milkvetch species are present in several locations in the Survey Area.

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
<i>Calliandra eriophylla</i> Pink fairyduster	CRPR 2B.3	Perennial deciduous shrub up to 2 feet in height, spreading from the base. Found in sandy washes, slopes or on mesas between 390 and 4921 feet. Occurs in Sonoran Desert scrub. Blooms from January to March.	High Potential Pink fairyduster is found on sandy or rocky substrates in desert wash habitats in Sonoran Desert scrub. Several sandy washes cross or run adjacent to the Survey Area and provide suitable habitat for this species.
Lamiaceae – Mint family			
<i>Teucrium cubense</i> ssp. <i>depressum</i> Dwarf germander	CRPR 2B.2	Annual herb found in sandy soils, including washes, fields, and alkaline flats, below 1,312 feet. Occurs in desert dunes, at the margins of playas and in Sonoran Desert scrub. Blooms from March to May but may also bloom September to November.	Moderate Potential Dwarf germander is associated with sandy soils, desert washes, fields and alkaline flats in Sonoran Desert scrub. Sandy soils and desert washes suitable for Dwarf germander are present in several locations along the Survey Area.
Loasaceae – Loasa family			
<i>Eucnide rupestris</i> Annual rock-nettle	CRPR 2B.2	Annual herb found growing on cliffs and in crevices in Sonoran Desert scrub between 1,640 and 1,970 feet. Blooms from December to April.	Unlikely Annual rock – nettle is found on cliffs and crevices and habitats resembling talus slopes. These habitat features are only present in a small area at the western end of the Survey Area.
<i>Mentzelia hirsutissima</i> Hairy stickleaf	CRPR 2B.3	Annual herb with an erect hairy stem branched at the base. Found in washes, alluvial fans, slopes and creosote scrub in Sonoran Desert scrub below 2,363 feet. Blooms from March to May.	High Probability Hairy stickleaf is associated with desert washes, slopes and alluvial fans in creosote-dominated vegetation communities. These rocky soil types are present in or adjacent to most of the Survey Area.

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
Polemoniaceae – Phlox family			
<i>Ipomopsis effusa</i> Baja California ipomopsis	CRPR 2B.1	Annual herb found in sandy soils and desert washes in Sonoran Desert scrub and chaparral below 328 feet. Blooms April to June.	High Potential Baja California ipomopsis is found in sandy soils and desert washes in creosote-dominated vegetation communities. These habitat conditions are common in locations across the Survey Area.
Polygonaceae – Buckwheat family			
<i>Nemacaulis denudata</i> var <i>gracilis</i> Slender cottonheads	CRPR 2B.2	Annual herb found in coastal and desert dunes and Sonoran Desert scrub up to 1,640 feet. Blooms from April to May.	High Potential Slender cottonheads is found in desert dune sands and creosote-dominated Sonoran Desert Scrub habitats. These habitat conditions are present in several locations throughout the Survey Area.
Simaroubaceae – Quassia or Simarouba family			
<i>Castela emoryi</i> Emory's crucifixion thorn	CRPR 2B.2	Perennial deciduous shrub found in dry, gravelly washes, non-saline dry lakes and outwash plains. Occurs in Mojavean and Sonoran Desert scrub and playas. Blooms primarily in June and July but may start as early as April and end as late as October.	Unlikely Emory's crucifixion-thorn occurs on gravelly washes on slopes, washes and plains in creosote-dominated habitats of Sonoran Desert scrub. A large population occurs in the western Yuha Desert at the Crucifixion Thorn Natural Area. The gravelly areas where water accumulates that Crucifixion Thorn prefers are not present within or adjacent to the Survey Area.
Solanaceae – Nightshade family			
<i>Lycium parishii</i> Parish's desert thorn	CRPR 2B.3	Perennial shrub found on sandy to rocky slopes and canyons in Coastal and Sonoran Desert scrub below 3,280 feet. Blooms from March to April.	Moderate Potential Suitable rocky slopes and canyons of Sonoran Desert scrub are present but not common in the Survey Area.

Status Definitions:

CRPR – California Rare Plant Rank

- 1A. Presumed extinct in California and elsewhere
- 1B. Rare or Endangered in California and elsewhere
- 2A. Presumed extinct in California, more common elsewhere
- 2B. Rare or Endangered in California, more common elsewhere

CRPR Threat Ranks:

- .1 – Seriously endangered in California
- .2 – Fairly endangered in California
- .3 – Not very endangered in California

Appendix E:
Table of Potential Special-Status Wildlife Species

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
VERTEBRATES			
Reptiles			
<i>Coleonyx switaki switaki</i> Barefoot banded gecko	State Threatened; CDFW Species of Special Concern; BLM Sensitive	Found in rocky habitats in the foothills of the eastern facing Peninsular Ranges. Habitats include volcanic flows and hillsides of volcanic rock or granitic boulders. Also found in sandstone habitats, washes, and arroyos.	High Potential Suitable rocky hillside habitat within the species' known range is present at the western end of the Survey Area.
<i>Crotalus ruber</i> Red-diamond rattlesnake	CDFW Species of Special Concern.	Occurs from sea level to 3000 ft in chaparral, woodland, pine forest, and arid desert habitats with rocky areas and dense vegetation.	Unlikely Suitable desert scrub habitat occurs only at the western end of the Survey Area. This location is the extreme eastern edge of the species' range.
<i>Phrynosoma mcallii</i> Flat-tailed horned lizard	CDFW Species of Special Concern; BLM Sensitive	Associated with relatively flat sandy areas with small shrubs that form hummocks of wind-blown sand. Found in association with its primary food source, harvester ants (genera <i>Messor</i> and <i>Pogonomyrmex</i>)	Present The Survey Area is within the Yuha Desert Management Area for flat-tailed horned lizards and contains suitable habitat. This species was observed during surveys.
<i>Uma notata</i> Colorado Desert fringe-toed lizard	CDFW Species of Special Concern; BLM Sensitive	Associated with sparsely vegetated flat sandy areas, where small shrubs form hummocks of wind-blown sand. Burrows in fine loose sand.	High Potential Survey Area contains patches of suitable sandy habitat and individuals have been observed by biologists in this area within the last two years.
Birds			
<i>Accipiter cooperii</i> Cooper's hawk	CDFW Watch List	Found in forest and woodland habitats but have adapted well to suburban landscapes and parks.	Unlikely Marginal habitat in the form of windbreak trees between agricultural fields and landscape-vegetation around farmhouses is present east of

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
			the Survey Area.
<i>Accipiter striatus</i> Sharp-shinned hawk	CDFW Watch List	Found in forested or brushy habitats and avoids open habitats.	Unlikely Winter visitor in the Survey Area. Marginal habitat is present east of the Survey Area along windbreaks between agricultural fields.
<i>Aquila chrysaetos</i> Golden eagle	BLM Sensitive; CDFW Fully Protected Species, CDFW Watch List; Federal Bald and Golden Eagle Protection Act	Open country, including mountains, foothills, plains and desert. Nest on cliffs or large trees.	Moderate Potential Suitable nesting sites occur along the eastern side of the Peninsular Range west of the Survey Area and suitable foraging resources are present throughout the Survey Area.
<i>Athene cunicularia</i> Burrowing owl	CDFW Species of Special Concern, BLM Sensitive	Open, dry grassland, desert floor, and agricultural fields, usually in association with California ground squirrels (<i>Otospermophilus beecheyi</i>) or other burrowing animal populations.	High Potential Suitable burrow habitat and foraging resources are present within the Survey Area.
<i>Buteo regalis</i> Ferruginous hawk	CDFW Watch List (wintering)	Winters in grassland and desert habitats where small mammal prey is abundant.	Moderate Potential Winter visitor in Southern California. Suitable open desert habitat and foraging resources are present in the Survey Area.
<i>Buteo swainsoni</i> Swainson's hawk	State Threatened; BLM Sensitive	Dry grasslands, plains, livestock ranges. Migrates through Imperial County in large flocks.	Moderate Potential May migrate through the Survey Area in large numbers over a concentrated seasonal period.
<i>Charadrius montanus</i> Mountain plover	CDFW Species of Special Concern; BLM Sensitive	Winters in the Southern California region, making use of desert flats and plowed fields.	Moderate Potential Known to overwinter in the Imperial Valley. Suitable winter habitat is present along the Survey Area and to the west.

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
<i>Empidonax traillii extimus</i> Southwestern willow flycatcher	Federal Endangered; State Endangered	Breeds in riparian tree and shrub vegetation found along rivers, swamps, lakes and reservoirs. Will nest in native and non-native vegetation.	Unlikely Suitable breeding and foraging habitat is not present in the Survey Area. Small patches of low-quality habitat is present along some irrigation canals to the east of the Survey Area.
<i>Falco mexicanus</i> Prairie falcon	CDFW Watch List	Prairies, plains, deserts and open hills with bluffs and cliffs for nesting.	High Potential Suitable nesting habitat is present west of the Survey Area and suitable foraging habitat is present throughout the Survey Area.
<i>Falco peregrinus anatum</i> American peregrine falcon	CDFW Fully Protected Species;	Open habitats, particularly along water sources (e.g. coast lines and rivers) where cliffs are present for nesting. Requires an ample supply of birds as a prey base.	Unlikely Potential Suitable rocky cliff areas are present west of the Survey Area. Agricultural areas to the east of the Survey Area have an ample supply of avian prey sources. The Survey Area is not close to water sources associated with higher quality habitats.
<i>Lanius ludovicianus</i> Loggerhead shrike	CDFW Species of Special Concern	Open areas of woodland, grassland, or desert with few scattered trees or large shrubs	Present Suitable habitat is present throughout the Survey Area. This species was observed in the Survey Area.
<i>Melanerpes uropygialis</i> Gila woodpecker	State Endangered; BLM Sensitive	Dry country with suitable nesting sites, including cottonwoods, large willows or mesquites, palms, saguaros or other large cactus	No Potential Suitable habitat is not present in the Survey Area. The Survey Area is on the extreme western edge of this species range and documented occurrences in the Imperial Valley are in excess of 50 years old.

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
<i>Polioptila melanura</i> Black-tailed gnatcatcher	CDFW Watch List	Desert habitats including washes, ravines, dry washes, mesquite stands or other shrub habitats.	High Potential Suitable nesting and foraging habitat occurs throughout the Survey Area.
<i>Toxostoma crissale</i> Crissal thrasher	CDFW Species of Special Concern	Found in dense scrubby vegetation such as mesquite thickets and dense riparian scrub.	Unlikely Small stands of mesquite in washes near the Survey Area are marginal habitats for this species. No suitable habitat in the Survey Area.
<i>Toxostoma lecontei</i> Le Conte's thrasher	CDFW Species of Special Concern	Desert flats with scrub vegetation, mesquite, riparian brush and creosote bush.	Moderate Potential Suitable desert flat habitat dominated by creosote bush occurs throughout the Survey Area. Documented occurrences in the Yuha Desert are over 50 years old.
<i>Leiothlypis luciae</i> Lucy's warbler	CDFW Species of Special Concern; BLM Sensitive	Riparian mesquite woodlands.	No Potential No suitable habitat occurs in or near the Survey Area.
Mammals			
<i>Antrozous pallidus</i> Pallid bat	CDFW Species of Special Concern; BLM Sensitive	Found in rocky arid regions near water where it roosts in rock crevices, caves or mam-made structures, including buildings, bridges or abandoned mines.	Moderate Potential Suitable roosting habitat is present to the west of the Survey Area. Water sources are limited, but present to the east of the Survey Area. Suitable foraging habitat in the Survey Area may draw individuals into the area at night.

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
<i>Chaetodipus fallax pallidus</i> Pallid San Diego pocket mouse	CDFW Species of Special Concern	Prefers rocky habitat near shrubs in a variety of habitat types.	Moderate Potential Suitable rocky habitat is present west of the Survey Area.
<i>Choeronycteris mexicana</i> Mexican long-tongued bat	CDFW Species of Special Concern	Associated with a variety of vegetation types. Day roosts are generally in the dimly lit portions of caves and abandoned mines (not in the deep and dark portions). Buildings and culverts are also occasionally used.	Unlikely Suitable roosting habitat does not occur in the Survey Area and suitable fruit, pollen or nectar foraging resources are present but scarce. Individuals may move through the area commuting from foraging to roosting sites at night.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	CDFW Species of Special Concern; BLM Sensitive	Roosts in caves, abandoned mines and sometimes buildings. Found in a variety of habitats from arid habitats to conifer forests. Moth specialist; will forage in desert landscapes, often close to vegetation level.	Moderate Potential Suitable roosting habitat is likely present in the rocky terrain to the west of the Survey Area. Suitable foraging resources are present and may draw individuals into the Survey Area at night.
<i>Euderma maculatum</i> Spotted bat	CDFW Species of Special Concern; BLM Sensitive	Found in areas of rough rocky terrain from open desert to Ponderosa pine. Roosts are often on high cliffs.	Unlikely Suitable roosting habitat is likely present west of the Survey Area and suitable foraging habitat is also present. This species is secretive and hard to document, there are few records in Imperial County.
<i>Eumops perotis californicus</i> Western mastiff bat	CDFW Species of Special Concern; BLM Sensitive	Roosts in rock crevices in rugged rocky areas or steep-walled canyons. Forages well above ground level and may range far from the roost site in search of prey.	High Potential This species has been observed in the Yuha Desert by biologists. Suitable roosting habitat is likely

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
			present in the rocky terrain to the west and south (in Mexico) of the Survey Area, and suitable foraging resources are present.
<i>Lasiurus blossevillii</i> Western red bat	CDFW Species of Special Concern	Roosts in trees and shrubs, typically associated with riparian habitats. Has been documented in suburban habitats and parks.	Unlikely Potential roosting and foraging habitat are present east of the Survey Area in agricultural and canal-edge habitats. May be replaced in this area by Western yellow bats.
<i>Lasiurus xanthinus</i> Western yellow bat	CDFW Species of Special Concern	Roosts in vegetation, including dead fronds of native and non-native palm trees. Associated with desert riparian habitats.	Moderate Potential Suitable roosting and foraging habitat are located east of the Survey Area where there are several older records.
<i>Macrotus californicus</i> California leaf-nosed bat	CDFW Species of Special Concern; BLM Sensitive	Found in desert lowland habitats. Roosts in caves and cave-like manmade structures, including mines, buildings, bridges and culverts. Forages in desert washes.	Moderate Potential Suitable roosting habitat may be present in the rocky terrain to the west of the Survey Area. Suitable foraging habitat is present, particularly at Pinto Wash. The nearest documented occurrence of this species is 25 miles north at Sweeny Pass.
<i>Myotis ciliolabrum</i> Small-footed myotis	BLM Sensitive	Associated with rocky cliffs and talus slopes in dry habitats. Forages along riparian corridors in chaparral, oak and pine forests, and along desert edges. Roosts in rock crevices, caves, mines, snags and buildings.	Unlikely Suitable roosting habitat occurs in the rocks and talus slopes just to the west of the Survey Area; but characteristic foraging area is lacking. No documented occurrences of this species

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
			east of the Peninsular Range in Imperial County.
<i>Myotis evotis</i> Long-eared myotis	BLM Sensitive	Associated more with forested habitats, but also known from semiarid shrublands, chaparral and agricultural areas. Typically roosts in hollow trees, under tree bark, in buildings, or in mines, caves and rock crevices. In San Diego, Long-eared bats are reported to used buildings and rock crevices.	No Potential Suitable rock crevices are present just west of the project; however, the forest and chaparral habitat they are typically associated with in this part of their range occurs west of the Peninsular Range. There are no documented occurrences of this species east of the Range.
<i>Myotis thysanodes</i> Fringed myotis	BLM Sensitive	Found in dry oak-pine montane forest, down to desert transition vegetation. In the desert transition fringed myotis can be found around palm groves in the eastern foothills of the Peninsular Range. Roost sites vary from dead snags, to rock crevices, and man-made structures including buildings, mines and bridges.	Unlikely Suitable rock crevice roosting habitat is present to the west of the Survey Area and suitable foraging habitat may be present. The Survey Area is likely at the eastern edge of suitable habitat for this species.
<i>Myotis yumanensis</i> Yuma myotis	BLM Sensitive	Typically associated with rivers, creeks, ponds and other water bodies. Roost in rock crevices, caves, mines, trees. Yuma myotis will also roost in man-made structures, particularly near water bodies, including buildings, bridges, mines, dam. Typically forages over open water.	Moderate Potential Suitable rock crevices are present west of the Survey Area Suitable manmade roosting habitat and foraging areas over water is present east of the project where irrigation canals are present.

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
<i>Nyctinomops femorosaccus</i> Pocketed free-tailed bat	CDFW Species of Special Concern	Roosts in crevices in rocky outcrops in the lowland desert southwest.	High Potential Suitable rock crevices are present west of the Survey Area, and suitable foraging habitat is present. Pocketed free-tailed bats have been documented 10 miles to the east of the project in Calexico, CA.
<i>Nyctinomops macrotis</i> Big free-tailed bat	CDFW Species of Special Concern	Roosts are found in high up in rock crevices on cliff faces in a variety of habitats from the coast to the mountains and into the desert. Forages long distances from its roost site.	High Potential Suitable rock crevices are present in the rocky terrain to the west of the project and suitable foraging habitat is present throughout the survey area. Big free-tailed bats have been documented 11 miles to the northeast of the project in El Centro Ca.
<i>Ovis canadensis nelsoni</i> Desert bighorn sheep (Peninsular Range distinct population segment)	State Threatened; Federal Endangered; BLM Sensitive.	Desert slopes of the Peninsular Ranges. Associated with steep, rugged terrain with sparse vegetation. Will also use canyon bottoms, alluvial fans and sandy washes to find water and forage.	High Potential Critical Habitat for Desert Bighorn Sheep is found at the west end of the Survey Area.
<i>Perognathus longimembris bangsi</i> Palm Springs little pocket mouse	CDFW Species of Special Concern; BLM Sensitive	Occupies desert and creosote scrub, and grassland habitats with sparse vegetative cover and loose on loosely packed or sandy soils	Moderate Potential Suitable habitat is present within the Survey Area. The Palm Springs little pocket mouse has been documented near Ocotillo, CA, approximately 10 miles to the Northwest of the Survey Area
<i>Sigmodon hispidus eremicus</i> Yuma hispid cotton rat	CDFW Species of Special Concern	Found in agricultural fields, riparian and wetland habitats. Reported to occur in Bermuda grass fields, brushy areas on the edge of agricultural fields, cottonwood-willow habitats, mesquite, saltcedar and	Moderate Potential Suitable habitat is present along canals and agricultural fields east of the Survey Area. Documented

NAME	STATUS	HABITAT	POTENTIAL TO OCCUR
		honey mesquite stands, and tule dominated wetlands.	occurrence in canal system at the east end of the Survey Area.
<i>Taxidea taxus</i> American badger	CDFW Species of Special Concern	Found in open areas vegetation communities including grasslands, alluvial fans, meadows and desert.	Moderate Potential Suitable open desert scrub habitat is present in the Survey Area.

**Appendix F:
Observed Plant Species**

Scientific Name	Common Name	Special-Status	Cal-IPC Rank
MONOCOTS			
Poaceae - Grass family			
<i>Hilaria rigida</i>	Big galleta		
* <i>Schismus barbatus</i>	Mediterranean schismus		Limited
EUDICOTS			
Asteraceae - Sunflower family			
<i>Ambrosia dumosa</i>	White bur-sage		
<i>Chaenactis</i> sp.	Pincushion		
<i>Encelia farinosa</i>	Brittlebush		
<i>Geraea canescens</i>	Desert sunflower		
* <i>Lactuca serriola</i>	Prickly lettuce		
Boraginaceae - Borage family			
<i>Cryptantha</i> sp.	Cryptantha		
<i>Tiquilia plicata</i>	Plicate tiquilia		
Brassicaceae - Mustard family			
* <i>Brassica tournefortii</i>	Sahara mustard		High
Cactaceae - Cactus family			
<i>Cylindropuntia bigelovii</i>	Teddy-bear cholla		
Chenopodiaceae - Goosefoot family			
<i>Atriplex canescens</i>	Four-wing saltbush		
<i>Atriplex polycarpa</i>	Many-fruit saltbush		
Fabaceae - Legume family			
<i>Olneya tesota</i>	Ironwood		
<i>Parkinsonia florida</i>	Blue paloverde		
<i>Prosopis glandulosa</i> var. <i>torreyana</i>	Honey mesquite		
<i>Senegalia greggii</i>	Catclaw acacia		
Fouquieriaceae - Ocotillo family			
<i>Fouquieria splendens</i> ssp. <i>splendens</i>	Ocotillo		
Krameriaceae - Rhatany family			
<i>Krameria bicolor</i>	White rhatany		

Malvaceae - Mallow family			
<i>Eremalche rotundifolia</i>	Desert five-spot		
<i>Sphaeralcea ambigua</i>	Desert globemallow		
Onagraceae - Evening Primrose family			
<i>Chylismia claviformis</i>	Browneyes		
<i>Eremothera boothii</i>	Booth's evening primrose		
Plantaginaceae - Plantain family			
<i>Plantago patagonica</i>	Desert plantain		
Polygonaceae - Buckwheat family			
<i>Chorizanthe rigida</i>	Rigid spineflower		
<i>Eriogonum inflatum</i>	Desert trumpet		
Zygophyllaceae - Caltrop family			
<i>Larrea tridentata</i>	Creosote bush		

* Non-native plant species

**Appendix G:
Observed Wildlife Species**

Scientific Name	Common Name	Special-Status
INVERTEBRATES		
Arachnids		
<i>Smeringurus</i> sp.	Dune scorpion	
Insects		
<i>Eleodes</i> sp.	Darkling beetle	
VERTEBRATES		
Reptilia (Reptiles)		
<i>Coleonyx variegatus</i>	Western banded gecko	
<i>Callisaurus draconoides</i>	Zebratail lizard	
<i>Uta stansburiana</i>	Side-blotched lizard	
<i>Chionactis annulata annulata</i>	Colorado Desert shovel-nosed snake	
<i>Crotalus mitchellii pyrrhus</i>	Southwestern speckled rattlesnake	
<i>Crotalus cerastes laterorepens</i>	Colorado Desert sidewinder	
<i>Aspidoscelis tigris tigris</i>	Great Basin whiptail	
<i>Phrynosoma mcallii</i>	Flat-tailed horned lizard	CSC
<i>Dipsosaurus dorsalis dorsalis</i>	Northern desert iguana	
<i>Sauromalus ater</i>	Common chuckwalla	
Aves (Birds)		
<i>Callipepla gambellii</i>	Gambel's quail	
<i>Phalacrocorax auritus</i>	Double-crested cormorant	
<i>Ardea herodias</i>	Great blue heron	
<i>Ardea alba</i>	Great egret	
<i>Egretta thula</i>	Snowy egret	
<i>Butorides virescens</i>	Green heron	
<i>Cathartes aura</i>	Turkey vulture	
<i>Buteo jamaicensis</i>	Red-tailed hawk	
<i>Falco sparverius</i>	American kestrel	
<i>Charadrius vociferus</i>	Killdeer	
<i>Himantopus mexicanus</i>	Black-necked stilt	
* <i>Columba livia</i>	Rock pigeon	

<i>*Streptopelia decaocto</i>	Eurasian collared-dove	
<i>Zenaida asiatica</i>	White-winged dove	
<i>Zenaida macroura</i>	Mourning dove	
<i>Columbina passerina</i>	Common ground-dove	
<i>Chordeiles acutipennis</i>	Lesser nighthawk	
<i>Calypte anna</i>	Anna's hummingbird	
<i>Tyrannus verticalis</i>	Western kingbird	
<i>Lanius ludovicianus</i>	Loggerhead shrike	CSC
<i>Corvus corax</i>	Common raven	
<i>Eremophila alpestris</i>	Horned lark	WL
<i>Auriparus flaviceps</i>	Verdin	
<i>Polioptila melanura</i>	Black-tailed gnatcatcher	
<i>*Sturnus vulgaris</i>	European starling	
<i>Phainopepla nitens</i>	Phainopepla	
<i>Quisaclus mexicanus</i>	Great-tailed grackle	
<i>*Passer domesticus</i>	House sparrow	

*Non-native wildlife species

CDFW Watch List = WL

CDFW Species of Concern = CSC

APPENDIX B

Air Emissions Calculations



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APPENDIX B
AIR EMISSIONS CALCULATIONS

Assumptions

Assumptions	Impacted Area	Notes
Border wall length:	15.25 miles	Equivalent to 80,520 ft
Total number of panels necessary:	10,053 panels	Assume 659.20 panels per mile. (659.20 panels/mile x 15.25 miles)
Total construction area:	241,560 sq ft	(80,520 ft of fence x 3 feet of fence width).
Estimated distance from wall to nearby town:	10 mi	Estimated distance from project sites to nearby town, such as Calexico.
Construction duration:	312 days	It is expected that the project will take more than a year to complete, but we have compressed all activities into a single year to assume a worst-case annual emission estimate. (52 weeks x 6 days per week)

APPENDIX B
AIR EMISSIONS CALCULATIONS

Estimated Equipment Usage*

Type of Equipment	Quantity	Total Days	Number of Trips	Total Usage	Total Usage Units	Comments
Loader	1	312	-	3744	hours	Assumed to be used 12 hours per day, 6 days per week, 52 weeks per year for 1 year. Assume dirt to be removed = 15.25 mi x (5280 ft/mi) x (3 ft wide) = 241,560 ft ² = 5.55 acres 241,560 ft ² x 6 ft deep = 1,449,360 ft ³ .
Dozer	1	71	-	852	hours	Assume spread and leveling dirt** at 48 m ³ /hour and 12-hour days = 576 m ³ /day (or 20,341.2 ft ³ /day). Total impacted volume (1,449,360 ft ³) / rate of spread and leveling (20,341 ft ³ /day) = 71 12-hour days = 852 hours. Assume dirt to be removed = 74 mi x (5280 ft/mi) x (3 ft wide) = 241,560 ft ² = 5.55 acres 241,560 ft ² x 6 ft deep = 1,449,360 ft ³
Excavator	1	14	-	168	hours	Assume digging*** 40 m ³ /hour and 12-hour days = 480 m ³ /day (or 16,951 ft ³ /day). Total impacted volume (241,560 ft ³) / rate of spread and leveling (16,951 ft ³ /day) = 14 12-hour days = 168 hours.
Crane	1	312	312	3744	hours	Assumed to be used 12 hours per day, 6 days per week, 52 weeks per year for 1 year.
Water Truck	1	-	312	4758	miles	Assume water truck stays at project site and drives 1525 miles in the project corridor every day. 312 trips x 15.25 miles = 4,758 total miles Based on round trip from California border to Calexico (10 miles one way).
Delivery Truck	1	-	2011	40212	miles	Assume necessary for construction. Assume 5 panels per trip. 10,053 total panels/5 panels per trip = 2,011 trips. 2,011 trips x 20 round trip miles = 40,212 miles. Based on round trip from California border to Calexico (10 miles one way).
Hauling Truck	1	-	111	2220	miles	Assume 10,053 panels at 550 lbs per panel are needed for construction. Assume flat bed truck with 50,000-lb capacity. 50,000lbs/550lbs = 91 panels per truck 10,053 panels/91 panels per trucks = 111 truck loads. 111 truck loads x 20 round trip miles = 2,220 miles.

APPENDIX B
AIR EMISSIONS CALCULATIONS

Estimated Equipment Usage*

Type of Equipment	Quantity	Total Days	Number of Trips	Total Usage	Total Usage Units	Comments
Cement Truck	1	-	21341	426820	miles	<p>Based on estimated distance between batch plant and construction site (10 miles one way). Assume 8-yd³ concrete capacity per delivery. Assume wall footing = 27.5ft x 1ft x 2ft = 55ft³ x 5280ft/mi = 290,400 ft³ of cement per mile of footing. 290,400 ft³/mile x 17.25 mi = 4,428,600 ft³ of cement for all footing. Assume 8 poles per 10-ft panel of fence and poles are 0.5-ft (6 in) x 0.5-ft (6 in) x 18-ft = 4.5 ft³*8 poles = 36 ft³. Assume poles filled half-capacity with cement to account for rebar = 36 ft³/2= 18 ft³ of cement per panel. 18ft³ x 10,053 panels = 180,954 ft³ of cement for panels. 4,428,600 ft³ + 180,954 ft³ = 4,609,554 ft³ = 170,724 yd³ of cement. 170,724 yd³ total of cement / 8-yd³ capacity per trip = 21,341 trips. 21,341 trips x 20 round trip miles = 426,820 miles.</p>
Passenger Car (Worker Commute)	7	-	312	43680	miles	<p>Based on round trip from California border to Calexico (10 miles one way). Assume one operator, two riggers, and one safety representative for crane; one operator and one assistant for all other equipment; 3 other construction site workers (e.g., foreman).</p>
Passenger Truck (Worker Commute)	8	-	312	49920	miles	<p>Assume 7 passenger cars (7 vehicles x 20 miles x 312 days = 43,680) and 8 passenger trucks (8 vehicles x 20 miles x 312 days = 49,920 miles).</p>

* Equipment usage is based off estimates from the Environmental Stewardship Plan For the Proposed Yuma Wall Replacement Project (https://www.cbp.gov/sites/default/files/assets/documents/2019-Jun/Yuma%20Primary%20Fence%20Replacement_Environmental%20Stewardship%20Plan.pdf)

** Excavation production and removal rates extracted from <https://www.methvin.org/construction-production-rates/excavation/bulk-excavation> to estimate PM10 for excavation using equation 4-4 from Air Emissions Guide for Air Force Transitory Sources, Methods for Estimating Emissions of Air Pollutants for Transitory Sources at U.S. Air Force Installations, August 2018 (<http://solutioenv.com/Documents/2018%20TransitorySourceGuide.pdf>)

***Spread and level (Average) rate for grading extracted from: <https://www.methvin.org/construction-production-rates/excavation/spread-and-level> - Dozer, 1.2m³ bucket, 50-200m², Sand/Soil Slow: 43.5 Average: 48.0 Fast: 52.6 Unit: m³/hr to estimate PM 10 using equation 4-4 from Air Emissions Guide (see previous bullet point).

APPENDIX B
AIR EMISSIONS CALCULATIONS

Equipment Emission Rates

Equipment	Horsepower (hp)	Emission Rate*						Unit
		VOC	CO	NOx	SO2	PM2.5	PM10	
Crane	300	0.14773	0.21564	1.01555	2.74E-03	3.90E-02	4.02E-02	g/hp-hr per day
Excavator	175	0.13668	0.2279	0.55829	2.65E-03	3.45E-02	3.56E-02	g/hp-hr per day
Dozer	175	0.14123	0.28219	0.7193	2.69E-03	4.89E-02	5.04E-02	g/hp-hr per day
Loader	100	0.58932	3.9348	3.03713	4.03E-03	0.51927	0.53533	g/hp-hr per day
Water Truck	-	6.45E-04	3.97E-03	1.12E-03	5.69E-07	3.36E-06	3.66E-06	lbs/mi
Cement Truck	-	5.73E-04	1.05E-03	0	6.98E-08	3.05E-07	3.32E-07	lbs/mi
Hauling Truck	-	5.73E-04	1.05E-03	0	6.98E-08	3.05E-07	3.32E-07	lbs/mi
Delivery Truck	-	5.73E-04	1.06E-03	0	6.98E-08	3.05E-07	3.32E-07	lbs/mi

Equipment	Type of PM Emission	Emission Rate*						Unit
		VOC	CO	NOx	SO2	PM2.5	PM10	
Passenger Truck	-	1.72E-04	7.28E-03	0.000132	6.60E-06	-	-	lbs/mi
	Primary Exhaust					9.10E-06	1.03E-05	lbs/mi
	Tirewear Particulate					3.38E-05	2.25E-05	lbs/mi
	Brakewear Particulate					1.67E-05	0.000134	lbs/mi
Passenger Car	-	1.06E-04	5.79E-03	7.80E-05	5.41E-06	-	-	lbs/mi
	Primary Exhaust					6.26E-06	7.07E-06	lbs/mi
	Tirewear Particulate					3.38E-06	2.25E-05	lbs/mi
	Brakewear Particulate					8.05E-05	1.01E-05	lbs/mi

* Emission rates extracted from the Environmental Stewardship Plan For the Proposed Yuma Wall Replacement Project (https://www.cbp.gov/sites/default/files/assets/documents/2019-Jun/Yuma%20Primary%20Fence%20Replacement_Environmental%20Stewardship%20Plan.pdf) which were originally acquired from USEPA's Motor Vehicle Emission Simulator (MOVES).

Fugitive Dust Emissions

Equipment	Type of PM Emission	Acreage	Emission Rate**		Unit
			PM2.5***	PM10	
Excavator	Fugitive Dust	22.91	2	20	lb/ac-day
Dozer	Fugitive Dust	22.91	2	20	lb/ac-day

** Emission rates extracted from Air Emissions Guide for Air Force Transitory Sources, Methods for Estimating Emissions of Air Pollutants for Transitory Sources at U.S. Air Force Installations, August 2018 (<http://solutionenv.com/Documents/2018%20TransitorySourceGuide.pdf>)

*** PM2.5 was calculated using PM10 conversion factor of 0.1 acquired from Background Document for Revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emission Factors (<https://www3.epa.gov/ttn/chief/ap42/ch13/bgdocs/b13s02.pdf>)

APPENDIX B
AIR EMISSIONS CALCULATIONS

Equipment Emissions

Equipment	Total Emissions (lbs/year)*					
	VOC	CO	NOx	SO2	PM2.5**	PM10**
Crane	365.8157	533.9775	2514.7507	6.7849	96.5736	99.5451
Excavator	8.8591	14.7716	36.1863	0.1718	643.7162	6417.1075
Dozer	46.4238	92.7589	236.4418	0.8842	3269.2940	32548.7703
Loader	486.4336	3247.8430	2506.8927	3.3264	428.6133	441.8694
Water Truck	3.0672	18.9069	5.3309	0.0027	0.0160	0.0174
Cement Truck	244.3715	450.2097	0.0000	0.0298	0.1303	0.1416
Hauling Truck	1.2710	2.3417	0.0000	0.0002	0.0007	0.0007
Delivery Truck	23.0230	42.8177	0.0000	0.0028	0.0123	0.0133
Passenger Truck	8.5992	363.4026	6.5820	0.3293	2.9755	8.3174
Passenger Car	4.6113	252.7980	3.4065	0.2363	3.9364	1.7321
TOTAL	1192.4755	5019.8277	5309.5908	11.7684	4445.2680	39517.5149

* Total emissions for Crane, Excavator, Dozer, and Loader were calculated using the following formula: *Total emission (lbs) = Emission rate (g/hp-hr per day) * Hours equipment is used (hrs) * Horsepower of equipment (hp) * g to lb conversion factor*

Total emissions for Water Truck, Cement Truck, Hauling Truck, Delivery Truck were calculated using the following formula: *Total Emission (lbs) = Emission rate (lbs/mi) * Total miles driven (mi)*

** PM emission values for Excavator and Dozer include primary exhaust and fugitive dust emission rates.

PM emission values for Passenger Truck and Car include primary exhaust, tirewear particulate, and brakewear particulate emission rates.

APPENDIX B
AIR EMISSIONS CALCULATIONS

Summary

Type of Emission	VOC	CO	NOx	SO2	PM2.5	PM10
Project Emissions (tons/year)	0.59624	2.50991	2.65480	0.00588	2.22263	19.75876
Significance Threshold for Non-attainment Areas (tons/year)*	50	100	100	100	Moderate: 100 Serious: 70	Moderate: 100 Serious: 70

*Threshold data acquired from 40 CFR 93.153(b)(1) and Gulf South Research Corporation (GSRC) model projections
(https://ecfr.io/Title-40/pt40.22.93#se40.22.93_1153)

APPENDIX D

Waters of the U.S. Jurisdictional Assessment



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JURISDICTIONAL ASSESSMENT REPORT EL CENTRO FENCE REPLACEMENT PROJECT

**Work Order 3 Task Order 27
FME Contract: GS10F0070W
March 2020**

Prepared For:

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Jurisdictional Assessment Report

El Centro Fence Replacement Project

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Figure 2: Project Location Map

Figure 3: Vegetation Community Map

Figure 4: Soil Map

Figure 5: Preliminary Section 404 Jurisdictional Assessment Areas Map

Appendices

Appendix A: Photographic Log

Abbreviations

AMSL	Above Mean Sea Level
AOR	Area of Responsibility
BMP	Best Management Practice
BLM	Bureau of Land Management
CBP	Customs and Border Protection
CDFW	California Department of Fish and Wildlife
CWA	Clean Water Act
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
GPS	Global Positioning System
HTL	High Tide Line
IBWC	International Boundary and Water Commission
OHWM	Ordinary High Water Mark
POE	Port of Entry
SSURGO	Soil Survey Geographic Database
TOB	Top-of-Bank
U.S.	United States
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey

1. Introduction

1.1. Project Description

United States Customs and Border Protection (CBP) propose to replace existing vehicle and pedestrian fence totaling approximately 15 miles with new bollard fence in the Calexico Station Area of Responsibility (AOR) within the CBP El Centro Sector. The planned construction corridor will be 60 feet wide and within the Roosevelt Reservation. The replacement fence will be bollard style fence comprised of 6-inch diameter steel bollards, spaced 4-inches apart and will be 30 feet high. The project will include repairs and improvements to the existing patrol road, installation of a fiber optic cable for communications, installation of LED lighting, and installation of electrical utilities to supply power to the lighting and communications cable.

1.2. Project Location

The eastern terminus of the 15-mile fence replacement project is 9.70 miles west of the Calexico West Port of Entry (POE) and extends west to the base of the Jacumba Mountains within Imperial County, California (Figure 1 and 2). The Survey Area for the subject delineation consists of the 60-foot boundary north of the existing vehicle barricade following the main patrol road along the international boundary. The main patrol road is parallel to the United States (U.S.)/Mexico international boundary for the majority of the 15-mile project. There are several small sections where the main patrol road follows topography around the base of Mount Signal and strays north of the actual international border. For the purposed of the survey effort, biologists only surveyed 60 feet north of the existing vehicle barricade along the entire length of patrol road.

1.3. Purpose of the Jurisdictional Assessment

Portions of the Survey Area cross or are adjacent to potentially regulated water and wetland features under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and the California Department of Fish and Wildlife (CDFW). The purpose of this delineation report is to identify and evaluate these potentially regulated features to ensure the proposed project activities comply with state and federal law, namely Section 404 of the Clean Water Act.

1.4. Regulatory Framework

1.4.1. Clean Water Act Section 404

Section 404 of the Clean Water Act (CWA) gives the U.S. Environmental Protection Agency (EPA), California Regional Water Quality Control Boards, and the USACE regulatory and permitting authority regarding discharge of dredged or fills material into “navigable waters of the United States”. Section 502(7) of the CWA defines navigable waters as “waters of the United States, including territorial seas.” Section 328 of Chapter 33 in the Code of Federal Regulations (CFR) defines the term “waters of the United States” as it applies to the jurisdictional limits of the authority of the USACE under the CWA. A summary of this definition of “waters of the United States” in 33 CFR 328.3 includes the following:

- Waters used for commerce;
- Interstate waters and wetlands;
- “Other waters” such as intrastate lakes, rivers, streams, and wetlands;

- Impoundments of waters;
- Tributaries to the above waters;
- Territorial seas; and
- Wetlands adjacent to waters.

Therefore, for purposes of the determining USACE jurisdiction under the CWA, “navigable waters” as defined in the CWA are the same as “waters of the United States” defined in the CFR above. The limits of USACE jurisdiction under Section 404 of the CWA as given in 33 CFR Section 328.4 are as follows:

- Territorial seas: three nautical miles in a seaward direction from the baseline;
- Tidal waters of the United States: high tide line or to the limit of adjacent non-tidal waters;
- Non-tidal waters of the United States:
 - Ordinary high water mark (OHWM) or to the limit of adjacent wetlands;
 - Wetlands: to the limit of the wetland.

1.4.2. Clean Water Act Section 401

Whenever a 404 permit is used or given, a 401 certification must be provided for the use of that permit. This is for oversight by the EPA on the 404 program. The EPA has given the California Regional Water Quality Control Board the authority to waive, deny, or grant water quality certification for individual and nationwide permits under Section 401 of the CWA.

1.4.3. California Department of Fish and Wildlife - Fish and Game Code Section 1602

Fish and Game Code Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state not located on federal property. CDFW’s regulatory authority extends to include riparian habitat (including wetlands) supported by a river, stream, or lake regardless of the presence or absence of hydric soils and saturated soil conditions. CDFW jurisdiction generally spans from top of bank (TOB) of either side of the stream, or to the outer limit of the adjacent riparian vegetation (outer drip line), whichever is greater. Notification to CDFW is generally required for any project that will take place in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation.

2. Methods

In preparation of conducting the jurisdictional assessment applicable reference materials were reviewed during desktop analysis that would provide insight to the potential or presence of jurisdictional waters of the U.S. Following the desktop review, the biologists conducted a focused evaluation of wetland and waters indicators in the Survey Area between July 9, 2019 and July 12, 2019. The following sources were consulted prior to the site visit:

- 7.5-minute United States Geologic Survey (USGS) Coyote Wells, Yuha Basin, and Mount Signal Quadrangle (USGS 1972)

- Google Earth aerial photography (Google Earth 2019)
- National Wetland Inventory interactive website (USFWS 2015)
- NRCS Web Soil Survey (Soil Staff Survey 2019a)
- NRCS Official Soil Series Descriptions (Soil Staff Survey 2019b)
- NRCS National List of Hydric Soils (NRCS 2019)

2.1. Potential Wetlands and Non-Wetland Waters of the U.S. (CWA Section 404)

2.1.1. Non-wetland Waters

Bio-Studies Inc. biologists conducted a focused evaluation of the wetland and waters indicators within the Survey Area to determine the presence of “waters of the United States” other than wetlands potentially subject to USACE jurisdiction under Section 404 of the CWA. Other areas, besides wetlands, subject to USACE jurisdiction include lakes, rivers and streams (including intermittent streams) in addition to all areas below the high tide line (HTL) in areas subject to tidal influence. Jurisdiction in non-tidal areas extends to the OHWM defined as:

“...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”

Federal Register Vol. 51, No. 219, Part 328.3 (e). November 13, 1986

The USACE has issued specific guidance and data sheets for delineation of streams in the arid west region (Lichvar and McColley 2008, Curtis and Lichvar 2010). This guidance applies to “low-gradient, alluvial, ephemeral/intermittent channel forms” that may have a broad lateral extent and are often referred to as “washes” or “dry washes.” Earlier guidance for western arid regions contained in a USACE memorandum (USACE 2001) focuses on similar systems. Dry washes were determined to be present throughout the Survey Area and OHWM boundaries for each were delineated using sub-meter accuracy global positioning system (GPS) equipment and mapped on a topographic map. The areas of potential jurisdictional non-wetland waters were measured digitally using ArcGIS software.

2.1.2. Wetlands

Delineation of jurisdictional wetlands and non-wetland waters are based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (“USACE Manual”; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (“Arid West Supplement”; USACE 2008), and the *U.S. Army Corps of Engineers Regulatory Guidance Letter No. 05-05* (“RGL 05-05”, USACE 2005).

Section 328.3 of the Federal Code of Regulations defines wetlands as:

"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

EPA, 40 CFR 230.3 and CE, 33 CFR 328.3 (b)

The three parameters used to delineate wetlands are the presence of: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. According to the USACE Manual, for areas not considered “problem areas” or “atypical situations”:

"...[E]vidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination."

If an area was determined to be a wetland using the three parameter approach its boundary would have been mapped using sub-meter accuracy GPS equipment in the field. Within the Survey Area evidence of wetland hydrology (OHWM, mud cracking, and staining across Arizona crossings) was the only wetland indicator observed of the three parameters to delineate presence of wetlands. The Survey Area did not support appropriate habitat for hydrophytic vegetation or hydric soils essential to qualify an area as a wetland. Bio-Studies Inc. biologists did not include sample points as part of the survey effort as the need to delineate wetland areas was not warranted.

2.2. Potential CDFW - Fish and Game Code Section 1602

The Survey Area is located on federal lands located within the Roosevelt Reservation. The majority of the Survey Area is bordered by Bureau of Land Management (BLM) property to the north as well as private properties at the eastern end of the Survey Area. Projects undertaken on federal land and managed by federal agencies are not required to follow CDFW Section 1602 jurisdiction. Some agencies elect to follow CDFW Section 1602 regulations, therefore Section 1602 jurisdiction was identified in the field however only features that were potentially jurisdictional under the CWA are presented in this report. Issues related to CDFW Section 1602 are not discussed again in this report.

3. Site Description

3.1. Environmental Setting

The Survey Area is located immediately on the United States/Mexico international border, approximately 9.70 miles west of the Calexico West POE. The 15-mile project alignment lies between the western edge of agricultural lands in the City of Calexico and the base of the Jacumba Mountains to the west. The majority of the Survey Area is located within the Yuha Basin Area of Critical Environmental Concern by the BLM and is flanked by the Jacumba Wilderness Area to the west and private property and agricultural lands to the east. The project alignments is found within the Sonoran Basin and Range Ecoregion and three IV Ecoregions: Western Sonoran Basin, Western Sonoran Mountain Woodland and Shrubland, and Imperial Valley/Lower Coachella Valley (Bailey 1995; Griffith et al. 2016). These ecoregions are characterized by permeable sandy to gravelly loam soils with high potential for wind erosion, monsoonal precipitation in summer months supporting Sonoran creosote bush scrub and microphyll woodland habitats in dry washes. Elevations range between 25 to 200 feet above mean sea level (AMSL).

3.2. Vegetation

Plant species observed in the Survey Area were identified using Desert Jepson Manual (Baldwin et al. 2002) and the Jepson Flora Project (Jepson eFlora 2019) while vegetation classifications were determined using the United States National Vegetation Classifications Database (USNVC

2019). The vegetation within the Survey Area consists of a thin strip (approximately 10 to 20 feet) of native upland plant communities along the northern edge of the main border patrol road (Figure 3). The majority of these upland vegetation communities extend to the north from the Survey Area into the greater Yuha Basin. Small areas of disturbed habitat bisect the main patrol road which include off-road vehicular traffic, secondary patrol roads, and vehicle turn around areas.

The vegetation within the Survey Area consists of a both native and nonnative vegetation communities as follows: Disturbed Habitat, *Brassica tournefortii* - *Malcolmia africana* Ruderal Desert Forbs Alliance, *Chorizanthe rigida* - *Geraea canescens* Desert Pavement, *Larrea tridentata* - *Ambrosia dumosa* Shrubland, *Larrea tridentata* - *Ambrosia dumosa* - *Pleuraphis rigida* Desert Shrubland, *Larrea tridentata* - *Atriplex polycarpa* Desert Shrubland, *Larrea tridentata* - *Fouquieria splendens* Upper Bajada & Rock Outcrop Desert Scrub Alliance, and *Parkinsonia florida* - *Olneya tesota* Desert Wash Scrub Alliance.

3.2.1. Vegetation Community Descriptions

Disturbed Habitat

This vegetation classification covers the majority of the Survey Area and includes the main border patrol road. This vegetation class is dominated by bare ground with low cover of ruderal herbaceous plant species. These areas are routinely graded and maintained as part of CBP's road maintenance efforts.

Brassica tournefortii - Malcolmia africana Ruderal Desert Forbs Alliance (A4166)

This alliance type occurs in two small patches north of the main patrol road at the eastern end of the Survey Area. The ruderal forbland is dominated by Saharan mustard (*Brassica tournefortii*) with scattered annual plant species including fanleaf crinklemat (*Tiquilia plicata*), Booth's sun cup (*Eremothera boothii*), white bursage (*Ambrosia dumosa*), and popcorn flower (*Cryptantha* sp.).

Chorizanthe rigida - Geraea canescens Desert Pavement (CEGL009686)

This desert pavement association is found throughout the middle and eastern portion of the Survey Area and is characterized by rocky substrate derived from a diversity in parent material on southwestern aspects. Vegetative cover is sparse across this association with a dominance of low growing annual plant species including rigid spineflower (*Chorizanthe rigida*), hairy desert sunflower (*Geraea canescens*), popcorn flower, Booth's sun cup and scattered creosote bush (*Larrea tridentata*) throughout.

Larrea tridentata - Ambrosia dumosa Shrubland (CEGL002954)

This shrubland type is characterized by a codominance of creosote bush and white bursage and is located throughout the Survey Area. Annual plant species observed include popcorn flower, desert trumpet (*Eriogonum inflatum*), Booth's sun cup, and common Mediterranean grass (*Schismus barbatus*). At the western terminus of the Survey Area this shrubland included sparse cover of rhatany (*Krameria* sp.) and brittlebush (*Encelia farinosa*). Sparse cover of mesquite (*Prosopis* sp.) was present the larger drainage features across the entire Survey Area.

Larrea tridentata - Ambrosia dumosa - Pleuraphis rigida Desert Shrubland (CEGL005764)

This shrubland type is similar in stature to the above creosote bush - white bursage shrubland with the addition of big galleta grass (*Pleuraphis rigida*) as an additional codominant. This shrubland

type was found in the middle portion of the Survey Area within the bed of drainage features typically with sandy and fine textured soils. Other plant species observed included rhatany as well as large undisturbed areas covered by cryptobiotic crusts.

Larrea tridentata - Atriplex polycarpa Desert Shrubland (CEGL005765)

This shrubland type is found along the eastern extend of the Survey Area and is characterized by dense shrub cover of creosote bush and allscale saltbush (*Atriplex polycarpa*). Associated annual plant species present in low cover include popcorn flower, common Mediterranean grass, and wooly plantain (*Plantago patagonica*).

Larrea tridentata - Fouquieria splendens Upper Bajada & Rock Outcrop Desert Scrub Alliance (A3278)

This alliance occurs from the middle to the western extent of the Survey Area and includes creosote bush and ocotillo (*Fouquieria splendens*) as the dominant plant species. Associated plant species include sparse cover of rhatany, white bursage and teddy bear cholla (*Cylindropuntia bigelovii*).

Parkinsonia florida - Olneya tesota Desert Wash Scrub Alliance (A0588)

This tree dominated alliance was observed in two areas, one at the eastern terminus of the Survey Area and the second within the western portion of the Survey Area. This alliance is characterized by a codominance of blue paloverde (*Parkinsonia florida*) and desert ironwood (*Olneya tesota*) tree and is typically found within sandy substrates associated with bottomlands and drainages across the Survey Area. Associated annual species included common Mediterranean grass, popcorn flower, and wooly plantain.

3.3. Soils

The Soil Survey Geographic (SSURGO) Database for Imperial County, California was used to research soil types across the Survey Area. The U.S. Department of Agriculture Conservation Service indicated an incomplete record of soil classifications occurring within the Survey Area. Soil types identified by the SSURGO Database within the Survey Area were introduced in Section 3.3.1 below and identified in Figure 4.

Soil classification were only available for the easternmost 1.2 miles of the Survey Area and no soils were classified across the remainder of the Survey Area under the SSURGO Database for Imperial County. Although the availability of soil data was incomplete within the Survey Area, the Ecoregions of California: Descriptions of the Level IV Ecoregions of California (Griffith et al. 2016) was utilized to generally describe soil trends across the remainder of the Survey Area.

The majority of the Survey Area falls within the Western Sonoran Basins ecoregion which includes bajadas, alluvial fans, badland, and rolling hill topography and include sandstones and mudstones from the Palm Springs Formation. Soils are generally sandy to gravelly loam and high permeable and prone to wind erosion. The westernmost terminus of the Survey Area includes the Western Sonoran Mountain Woodland and Shrubland ecoregion which is characterized by large granitic boulders and steep canyons. The Eastern terminus of the Survey Area includes the Imperial/Lower Coachella Valley ecoregion and is composed of deposited silty soils and sediments from the Quaternary period when the Colorado River meandered across the delta. These areas are predominately used for agricultural purposes in present day.

3.3.1. Survey Area Soil Types

Rositas sand, 0 to 2 percent slopes

Rositas series are deep and permeable soils formed by eolian materials. Soils in this series are on dunes and sand sheets within hummocky topography

Meloland and Holtville loams

Meloland series are coarse-loamy over clayey and are light brown to very pale brown and may contain calcium carbonate. Holtville series includes deep permeable soils formed in stratified and mixed alluvium typical of floodplains and basins between zero to three percent slopes.

Vint loamy very fine sand

Vint series are deep and permeable soils formed in stratified stream alluvium typical of flood plains between zero to three percent slopes.

Imperial-Glenbar silty clay loams, wet, 0 to 2 percent slopes

Glenbar series are deep permeable soils that also formed in stratified stream alluvium typical of alluvial fans and flood plains. Soils are clay loam and may contain calcium carbonate.

3.4. Hydrology

Within the Survey Area the primary source of hydrology is direct precipitation in the spring with additional moisture from monsoonal rainfall during summer months and runoff from adjacent lands with precipitation values depending on elevation across the Survey Area. The climate of the Yuha Basin and Jacumba Mountains are hot-arid summers and mild winters with the precipitation events being heavily influenced by and a result of the adjacent mountain range (NOAA 2019; Bailey 1995). Anthropogenic disturbances are low to moderate throughout the Survey Area including off-highway vehicular use, numerous access roads used by the public, and the main patrol road parallel to the border used by CBP for surveillance. Although the natural topography is generally intact across the Survey Area, these disturbances have potentially bisected or modified drainage features over time and affecting the drainage and infiltration patterns of the area.

4. Results

Qualified biologists conducted a jurisdictional assessment of potentially regulated waters of the U.S. and wetlands within the Survey Area between July 9, 2019 and July 12, 2019. Atmospheric conditions during the field surveys were between 75 to 116 degrees Fahrenheit, winds averaged between zero and 10 miles per hour with clear skies. Figure 5 shows all potential waters of the U.S. occurring within the Survey Area.

4.1. Potential Waters of the United States (CWA Section 404)

4.1.1. Non-wetland Waters

Within the Survey Area one designated category of non-wetland water exists: ephemeral stream. Not all ephemeral streams across the Survey Area are considered potentially jurisdictional based on direction of flow, feature isolation, or connectivity to navigable waters of the U.S and such occurrences are discussed below.

4.1.1.1. Ephemeral Streams

Ephemeral streams are episodic channels that convey water flow during and immediately after precipitation events. Across the Survey Area the majority of these features are shallow bottomed narrow channels and often braided systems that stretch across alluvial fan and flood plain systems. Within this landscape several larger singular channels exist and were often culverted. Although these features appear larger due to surrounding topography, their single flow channels remained shallow and flows were not considered to be intermittent. The general directionality of all features across the Survey Area run in a north and south direction and bisect the Survey Area. With the rolling topography across the Survey Area features showed flow in both southerly and northerly directions.

In the northern foothills of Mount Signal along the eastern portion of the Survey Area many of the deeply incised stream channels within the Survey Area are associated with previously installed Arizona Crossing concrete pads which cross the main border patrol road. As no water staining or other evidence of flow was apparent during the survey period to define OHWM, the margins of the Arizona crossings were included in the jurisdictional assessment where appropriate. Within the same area of the project culverted stream crossings flowed under the main border patrol road were noted as part of the survey effort. While features north and south of the culverted areas could potentially be considered jurisdictional, portions of culverted features under the roadbed are not considered to be potentially jurisdictional. Figure 5 shows all features assessed within the Survey Area and details of each are discussed below. Feature names correspond to the photographic log in Appendix A.

- These features originate from the north edge of the main patrol road and continue to flow north connecting to waters of the U.S. downstream. Hydrology originates from adjacent rolling topography and sheet flow across main patrol access road. These potentially jurisdictional features are indicated as blue lines or polygons and include 51685, 51745, 51750, 51952, 51967, 51968, 51973, 73, 51974, 51995.
- Features with OHWM visible south of the vehicle barricade in Mexico, and flow north to be intersected by the main patrol road and continue at the north side of the patrol road and connect to waters of the U.S. downstream. These potentially jurisdictional features are delineated with a polygon crossing the main patrol road when OHWM indicators were present across road grading berms. Features that do not show OHWM across the main patrol road due to ongoing road maintenance are indicated by a single blue circle on the south edge of the main patrol road and a blue polygon on the north edge of the main patrol road. These features include 51739, 51931, 51954, 51959, 51960, 51970, 51975, 51983, 51984, 51986, 51987, 51993, 51994, 51999, 52490, 52563, 52567.
- Similarly, to the above described features originating from Mexico and flowing north into the United States, an existing concrete pad (Arizona crossing) within the main patrol road allows for potentially significant water flows while protecting the integrity of the road. These features and their associated Arizona crossings are considered to be potentially jurisdictional and include 51481, 51743, 51753, 51752, 51751, 51727, 51726, 51723, 51724 (flows into 723), 52373 (Pinto Wash) and 52375 (Pinto Wash).

- Two braided features (52371 and 52370) flow over the main patrol access road from north to south into Mexico. Immediately north of the Survey Area and upstream these features show connectivity to Pinto Wash and are considered to be a water of the U.S.
- Feature 52365 flows north from Mexico across main patrol road and follows the north edge of the road where it briefly leaves and returns to the Survey Area and eventually sheet flows into Pinto Wash. This feature is considered to be potentially jurisdictional as connectivity to a water of the U.S. was indicated in the field.
- Roadside overflow drains occur throughout the rolling terrain of the western half of the Survey Area. Typically, these Best Management Practice (BMP) structures were found at the southern edge of the larger Pinto Wash system which include steep cliff terrain immediately north of the Survey Area. These corrugated metal structures are set into the road berms with concrete and riprap and contain supported corrugated metal down drains which channelize flows from road runoff. The road runoff creates shallow channelized features inside the Survey Area that flow north and downhill into the greater Pinto Wash drainage system. There are six instances where earthen bottom features are found within the Survey Area immediately downstream of the metal down drains. These features (52464, 52493, 52524, 52527, 52530, and 52561) are considered to be potentially jurisdictional, although the corrugated overflow drains are not.

4.1.1.2. Manmade or relict features not mapped as Potentially Jurisdictional Features

Within the Survey Area there are several features that are either relict features that have no evidence of navigability, water conveyance, or features that convey water and are not considered potentially jurisdictional, all of which are discussed below.

- Drainage features occurring across the Survey Area and flow south into Mexico and as a result have no connectivity to waters of the U.S. These features include: 51447, 51448, 51451, 51453, 51455, 51456, 51459, 51461, 51465, 52021, and 52022 and associated Arizona crossing. Although feature 52022 is associated with an Arizona crossing which crosses the main patrol road, the upland topography north of this feature has no evidence of connectivity to waters of the U.S. The Arizona crossing serves as a BMP to prevent erosion of the main patrol road in this instance.
- One drainage feature (51737) occurring in the eastern portion of the Survey Area flows north into the U.S. from Mexico. This feature is located at the southern edge of the main patrol road ending at the road berm and as a result have no connectivity to waters of the U.S.
- Two features (51976 and 52539) presented OHWM indicators south of the main patrol road under the vehicle barriers with no evidence of OHWM indicators continuing to the north edge of the Survey Area and existing road. These features are not considered to be potentially jurisdictional as they lack connectivity to waters of the U.S.
- Three drainage features originating in Mexico and flowing north into the U.S. are all part of same overall drainage system. This system quickly turns south and any water conveyance sheet flows across the main patrol road and back into Mexico. These three features are isolated and have no connectivity to waters of the U.S.: 51956, 51957, and 51958.

- One drainage feature at western extent of Project flows north into the Crucifixion Thorn Natural Area, a dry lake bed approximately 3 miles northeast of the Survey Area. There is no evidence of this feature (52115) ever being navigable and is considered to be an isolated feature lacking connectivity to waters of the U.S. (CWA 2008).
- One concrete V-shaped feature (51449) occurs at the eastern terminus of the Survey Area. This feature is approximately eight feet wide and four feet deep and during the time of the survey was filled with windblown sand. This feature is aligned north to south and perpendicular to the intersection of the Westside Main Canal and the All American Canal, which lies to the east. Immediately north of the Survey Area boundary there is a head gate and infrastructure relating to the adjacent canal. This concrete feature serves as an overflow drain to the canal system and is not considered to be potentially jurisdictional.
- Roadside overflow drains occur throughout the rolling terrain of the western half of the Survey Area. Typically, these BMP structures were found at the southern edge of the larger Pinto Wash system which includes steep cliff terrain immediately north of the Survey Area. These corrugated metal structures are set into the road berms with concrete and riprap and contain supported corrugated metal down drains which channelize flows from road runoff. These overflow drains are man-made and are a result of the anthropogenic disturbance on the landscape. and are therefore not considered potentially jurisdictional. These features are identified on Figure 5 with yellow triangles.
- One erosional rill (51458) has caused head cutting originating from the main patrol road margin within the Survey Area. Within the Survey Area this feature does not exhibit indicators of ordinary high water marks. The road runoff creates shallow to deeply incised channelized feature inside the Survey Area. This feature is considered to be a direct result of anthropogenic disturbance and is not considered to be potentially jurisdictional (CWA 2008).
- Earthen swales are characterized by low points in gently rolling topography where no indicators of current flow were present. Vegetation and rocky substrates within and adjacent to the features was consistent across the landscape suggesting that these relict features were formed under historic conditions and prior to any alteration of the surrounding topography. These features were found throughout the Survey Area along both the north and south edges of the main patrol access road and are identified on Figure 5 with yellow pentagons.

4.1.2. Wetlands

Although, evidence of hydrology was present throughout the Survey Area, appropriate hydrophytic vegetation or hydric soils essential to qualify an area as a wetland were not observed. Bio-Studies Inc. biologists did not include sample points as part of the survey effort as wetland features were not observed or delineated throughout the Survey Area.

5. Discussion

5.1. Potential Jurisdictional Areas

Areas determined to be jurisdictional under Section 404 of the CWA were delineated based on field surveys conducted by Bio-Studies Inc. biologists on July 9, 2019 to July 12, 2019. The results of the delineation are summarized below.

5.2. Waters of the United States

Figure 5 depicts the extent of USACE jurisdiction within the Survey Area based on the jurisdictional assessment described above. Forty-nine features are identified as waters of the U.S within the Survey Area. The non-wetland waters would be avoided to the extent feasible and impact minimization measures will be implemented. In areas that cannot otherwise be avoided, some waters of the U.S. will be impacted by the planned Project due to the proposed primary fence installation activities. Therefore, the Project would result in both permanent and temporary impacts to waters of the U.S. Based on the results of a final impact assessment and availability of funds, jurisdictional waters would be restored as near to pre-construction conditions as possible (revegetated with appropriate native species) and permanent impacts would be offset in a manner consistent with regional standards. The square footage of potential Section 404 jurisdictional areas are summarized in Table 1.

Table 1 Summary of Potential Section 404 Jurisdictional Features

Potentially Jurisdictional Features	Area in Acres
Non-Wetland Waters	
Ephemeral Stream	2.69
Total	2.69

6. List of Preparers

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Senior Biologist

Years of Experience: 25

Lindsay Willrick

Senior Biologist

Years of Experience: 12

Brent Kober

GIS Manager

Years of Experience: 22

Stephanie Sherwood

GIS Manager

Years of Experience: 26

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**Figure 1:
Project Overview Map**



Figure 1

**Figure 2:
Project Location Map**

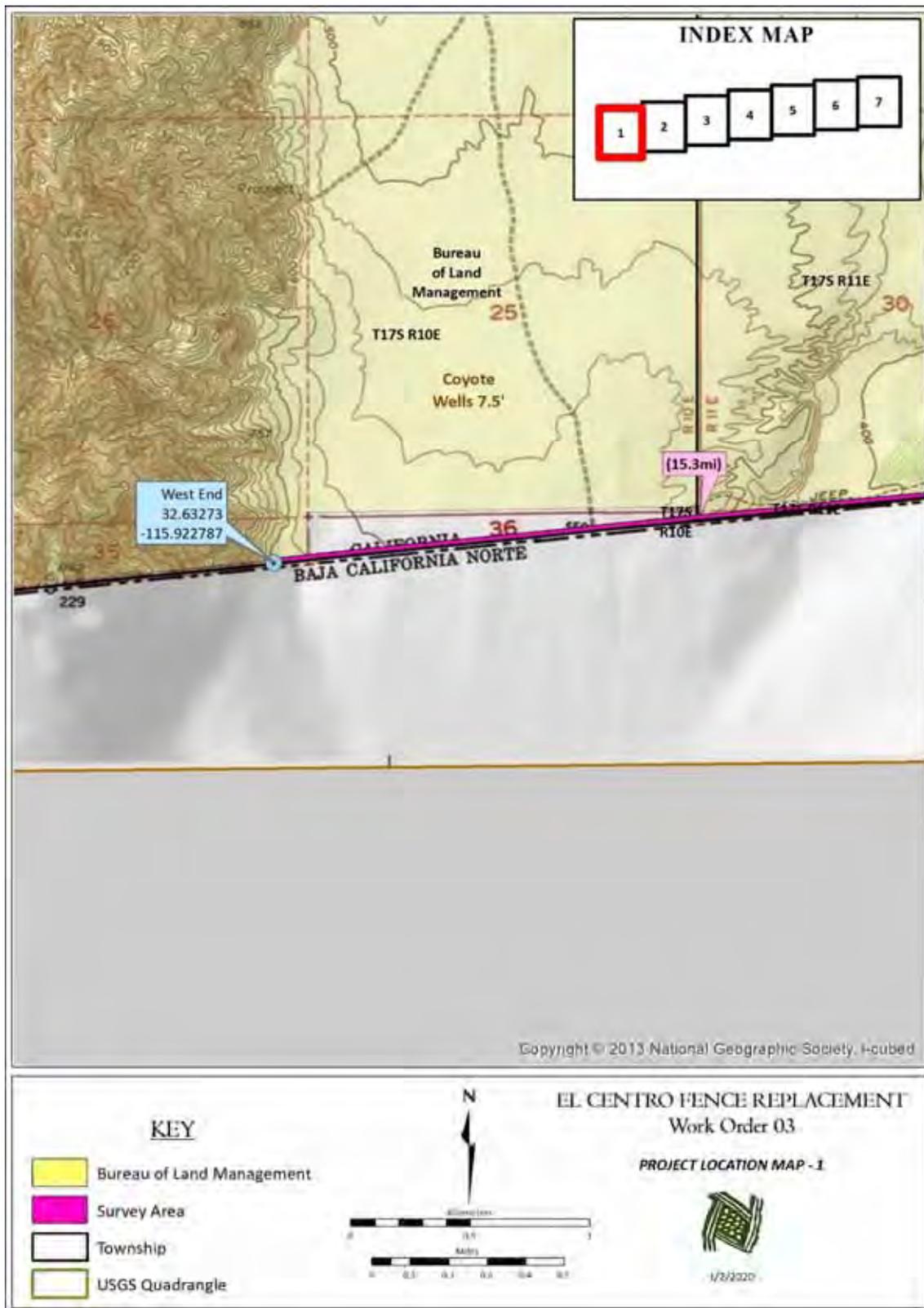


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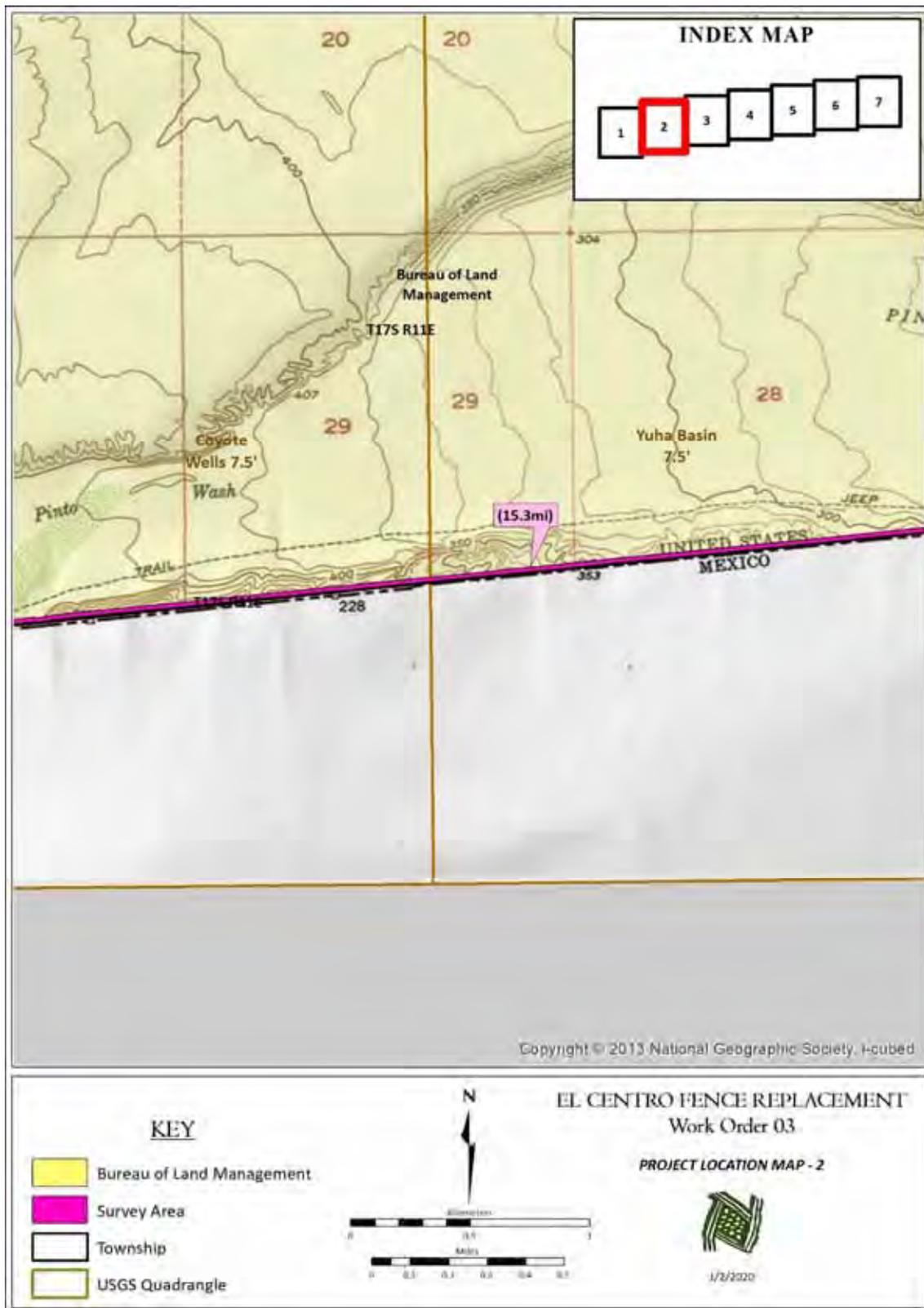


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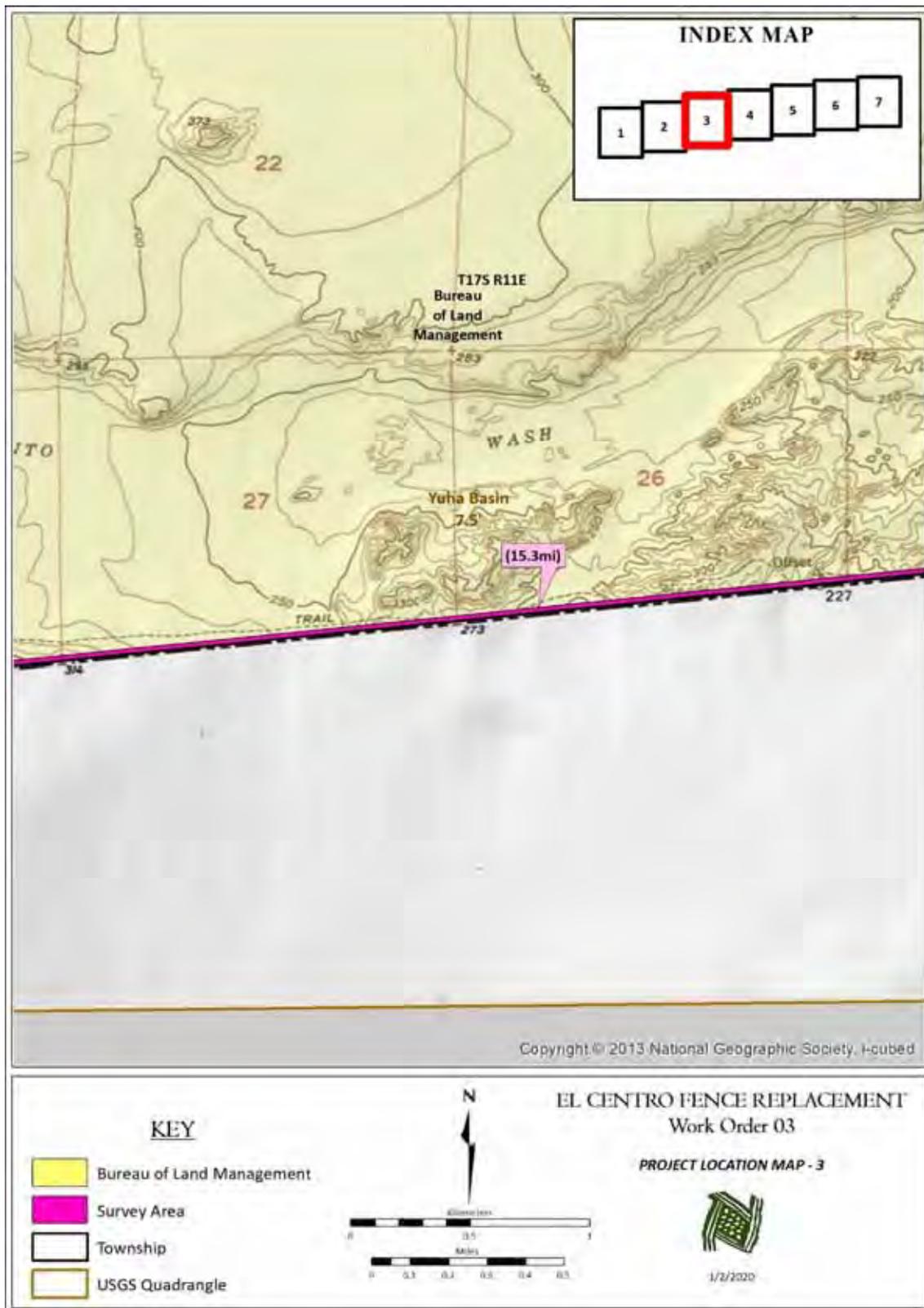


Figure 2



Figure 2

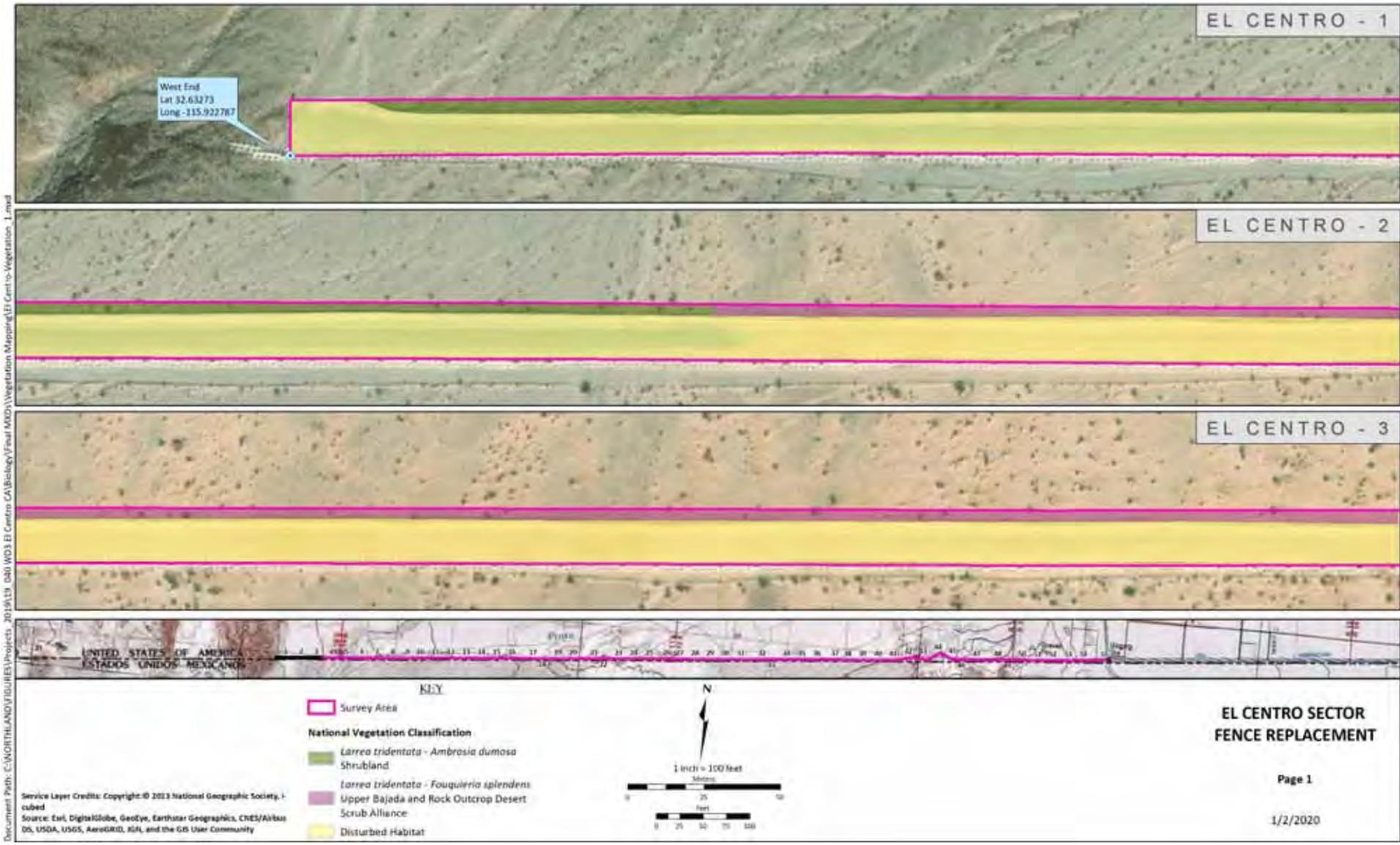


Figure 2



Figure 2

**Figure 3:
Vegetation Community Map**



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Figure 3

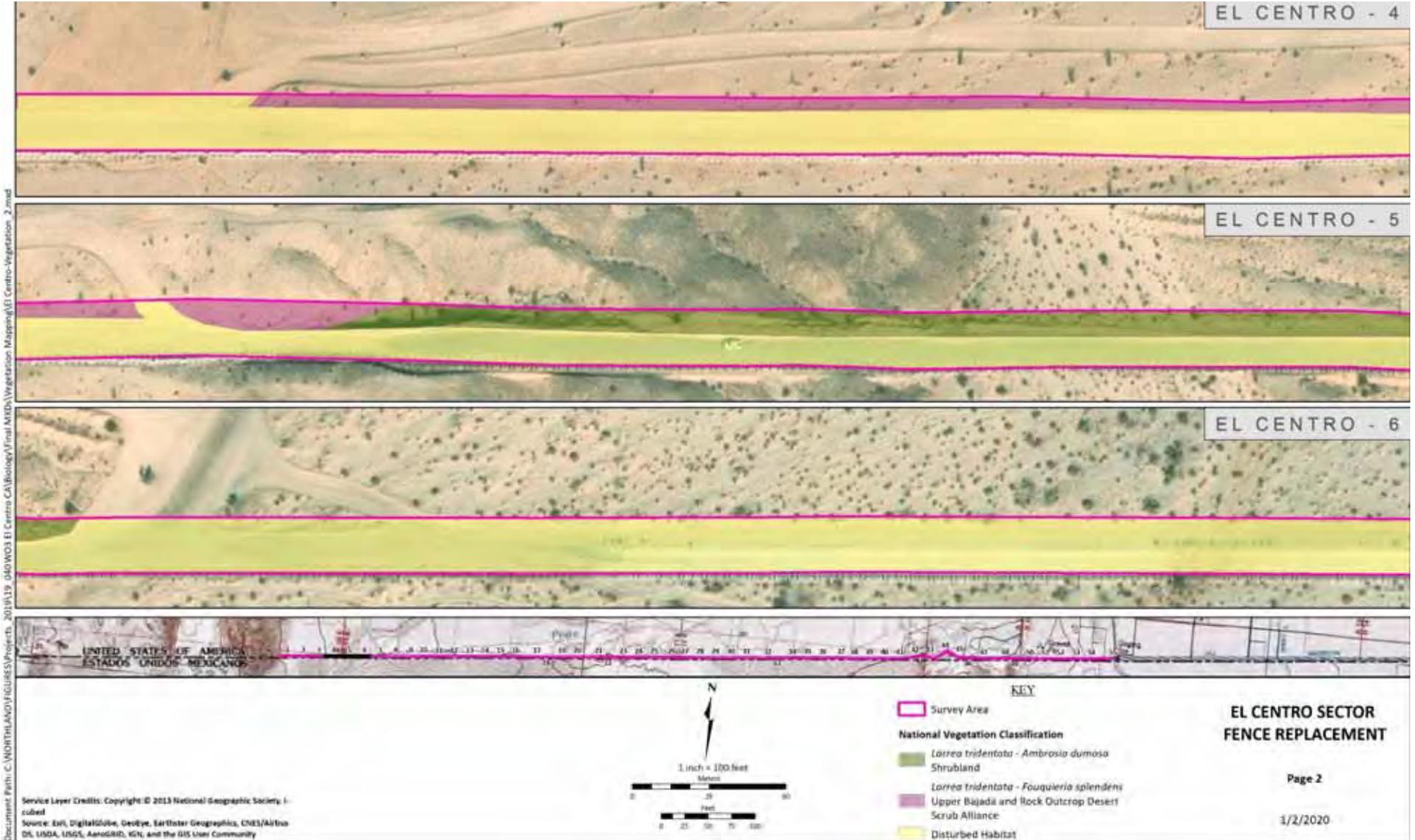


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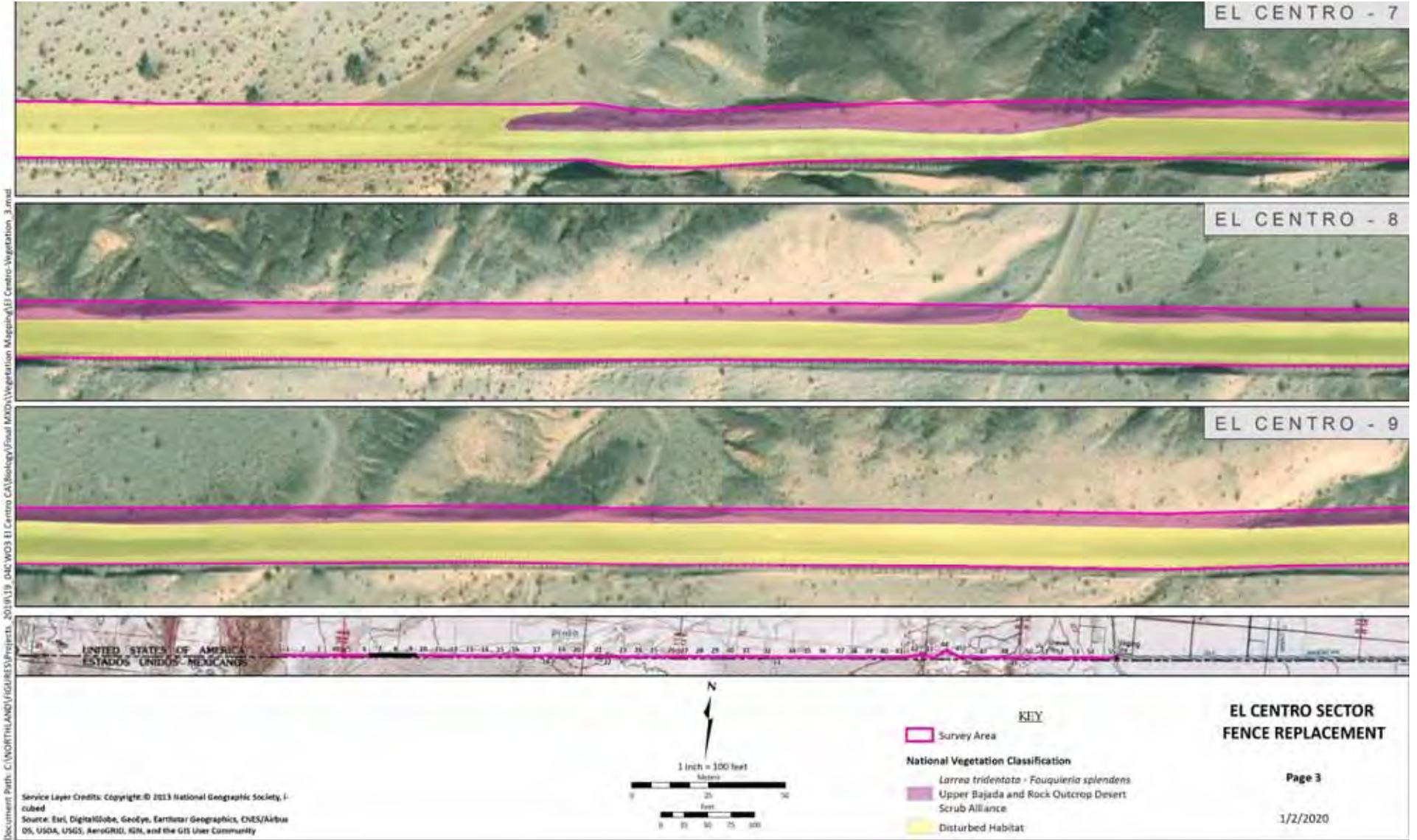


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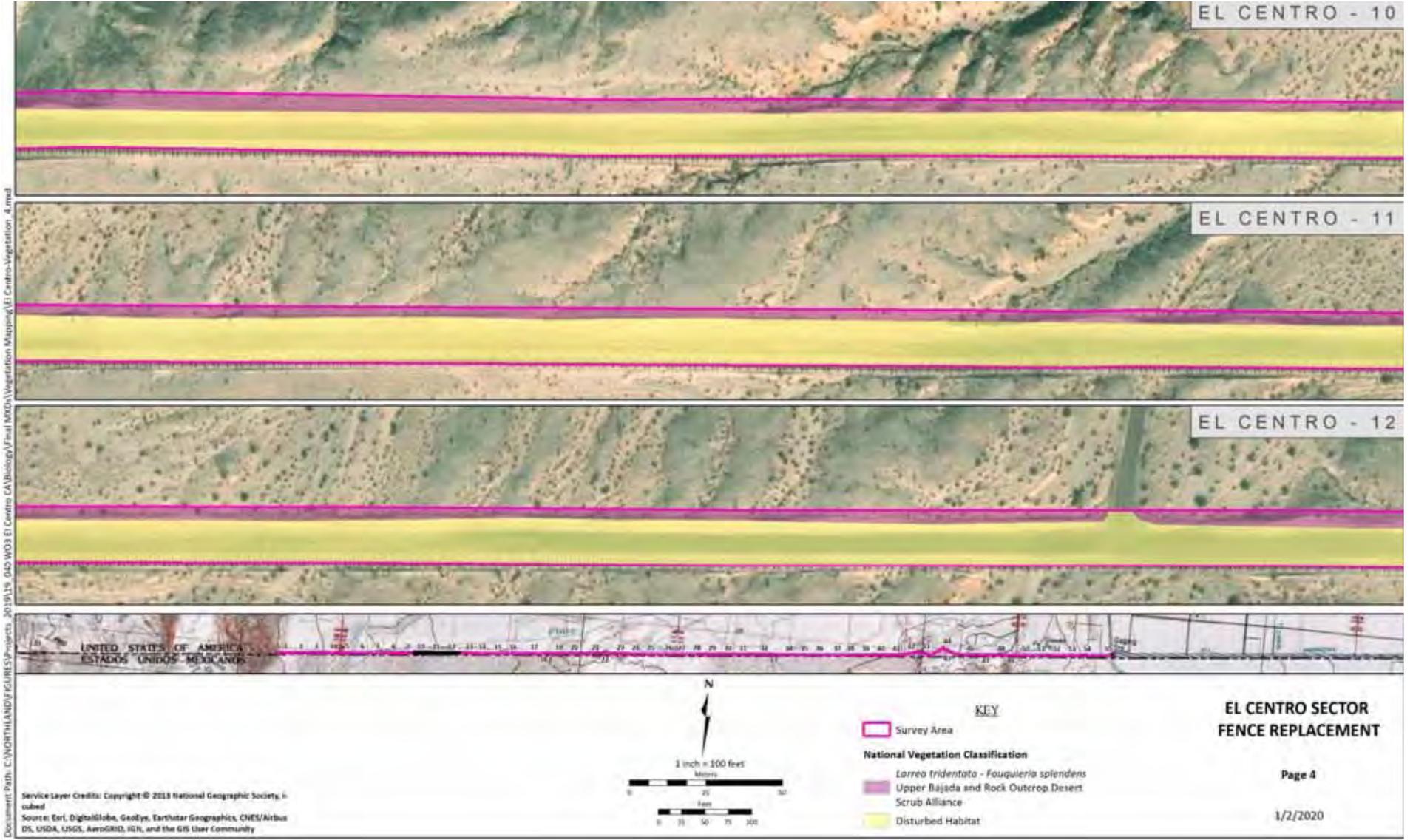


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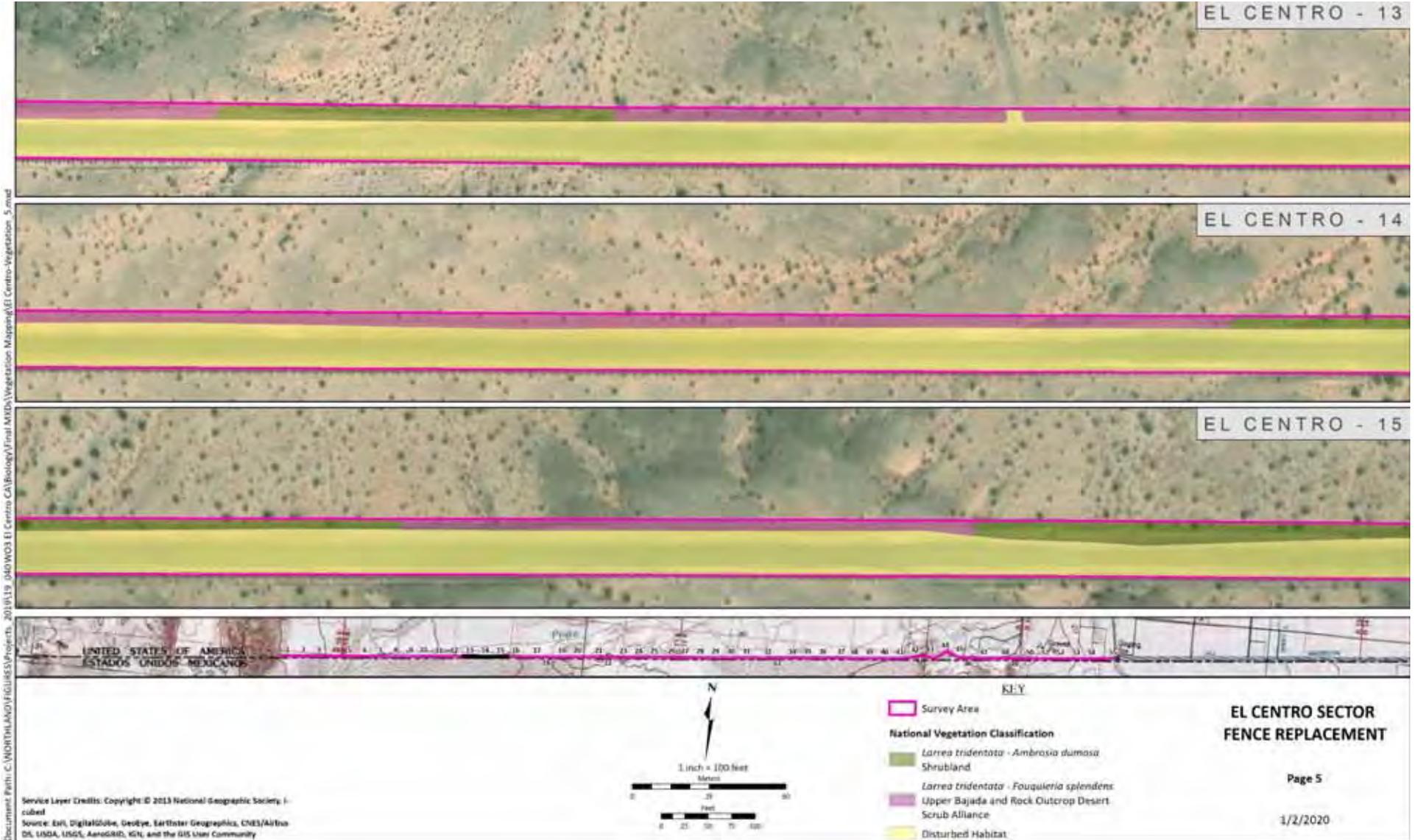


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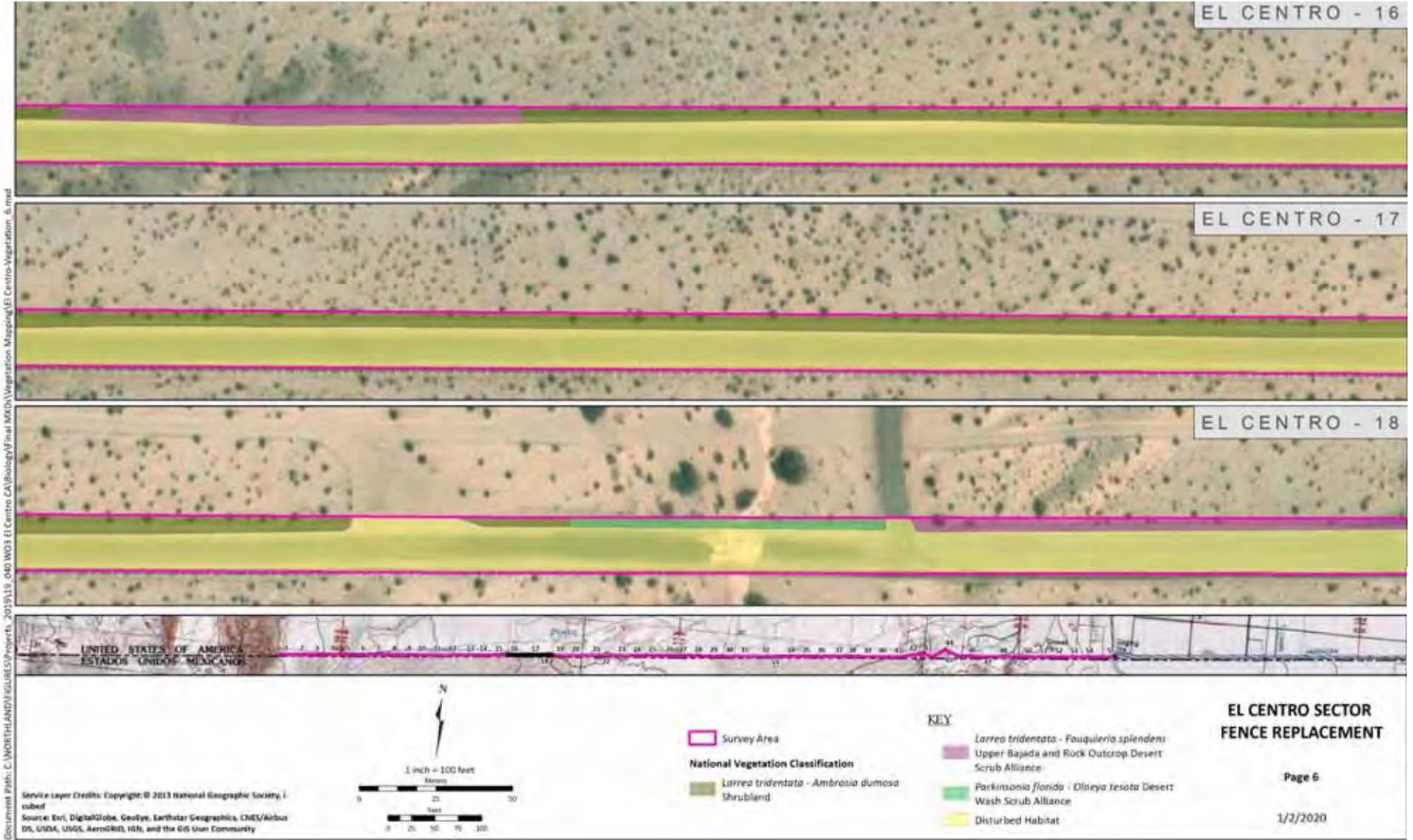


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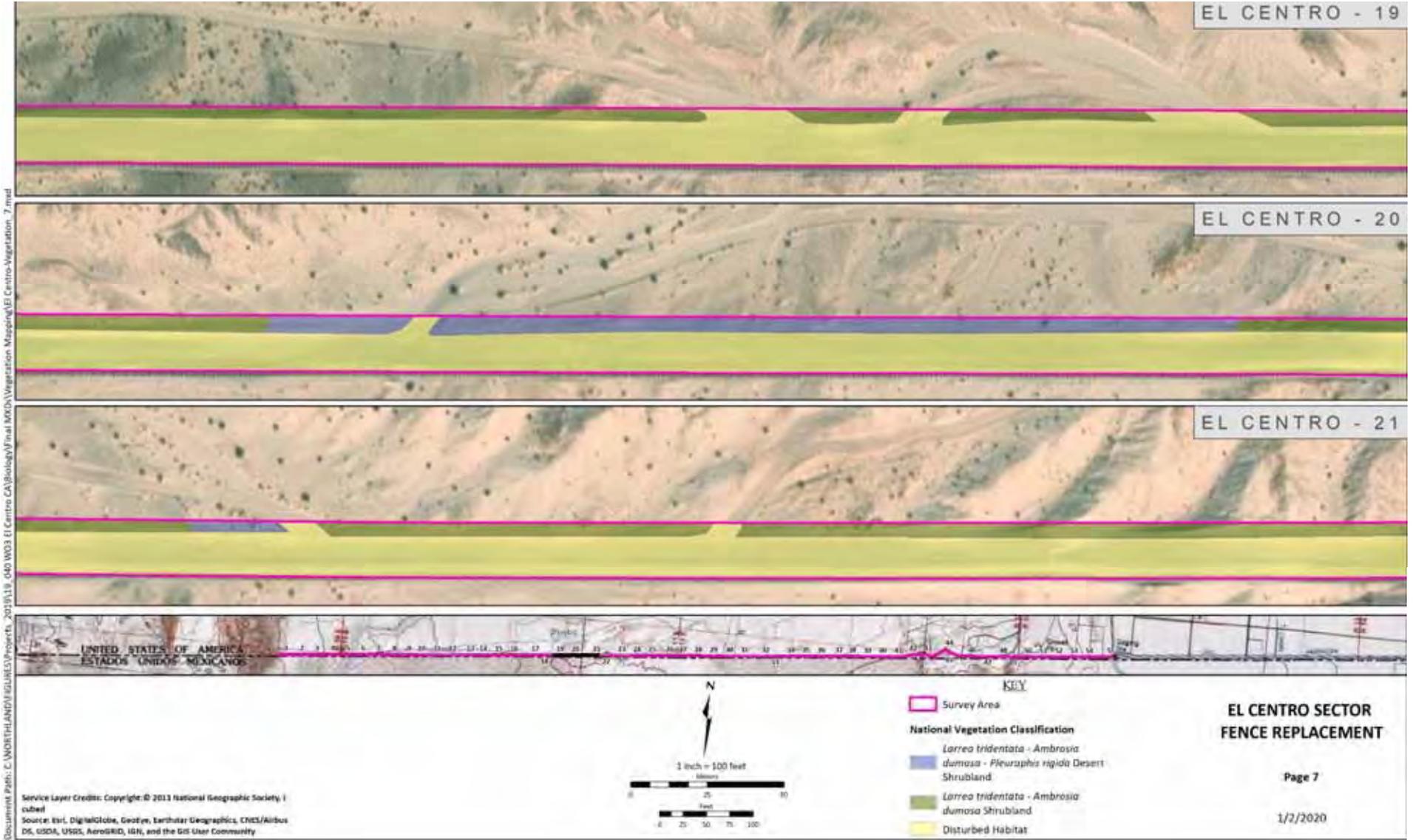


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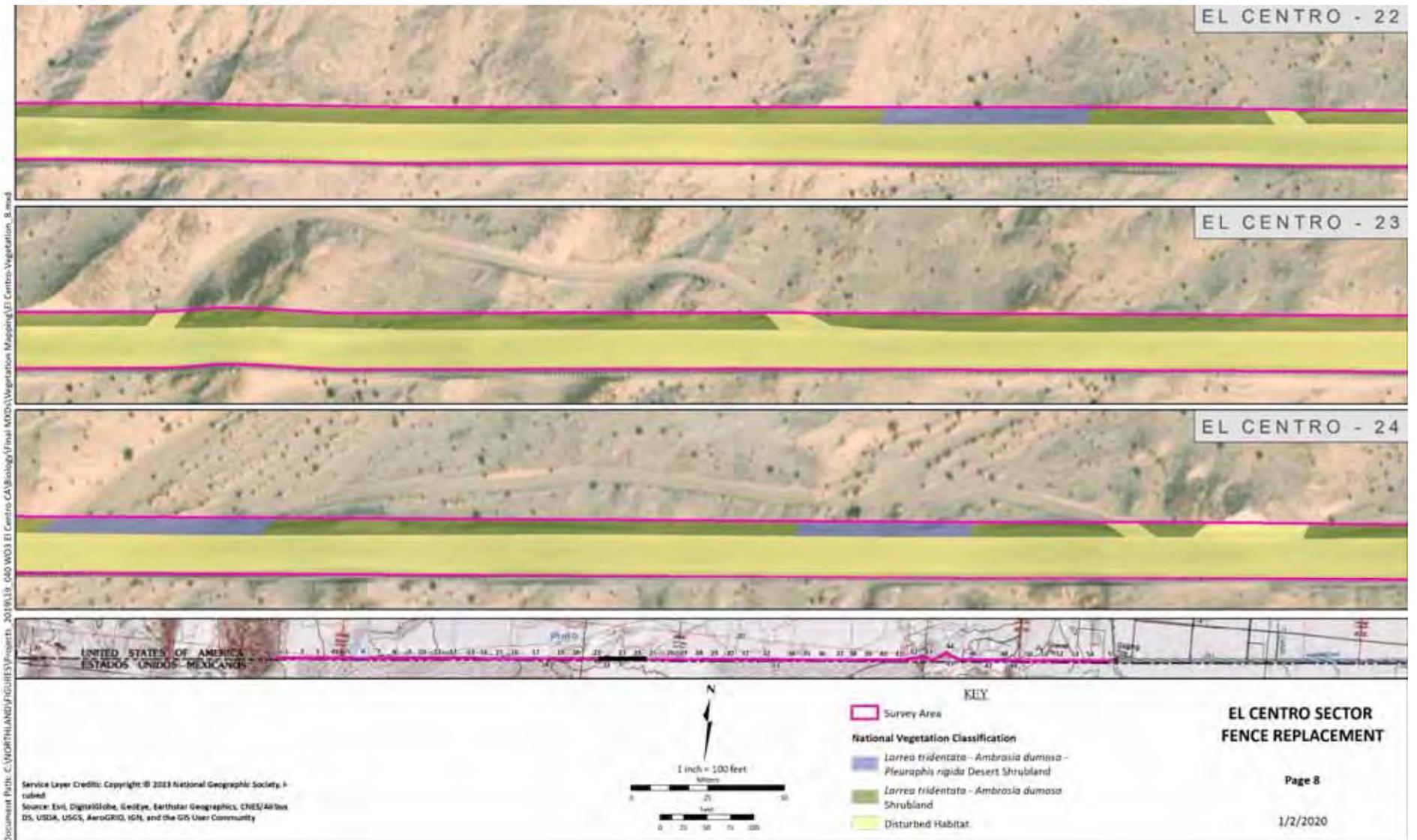


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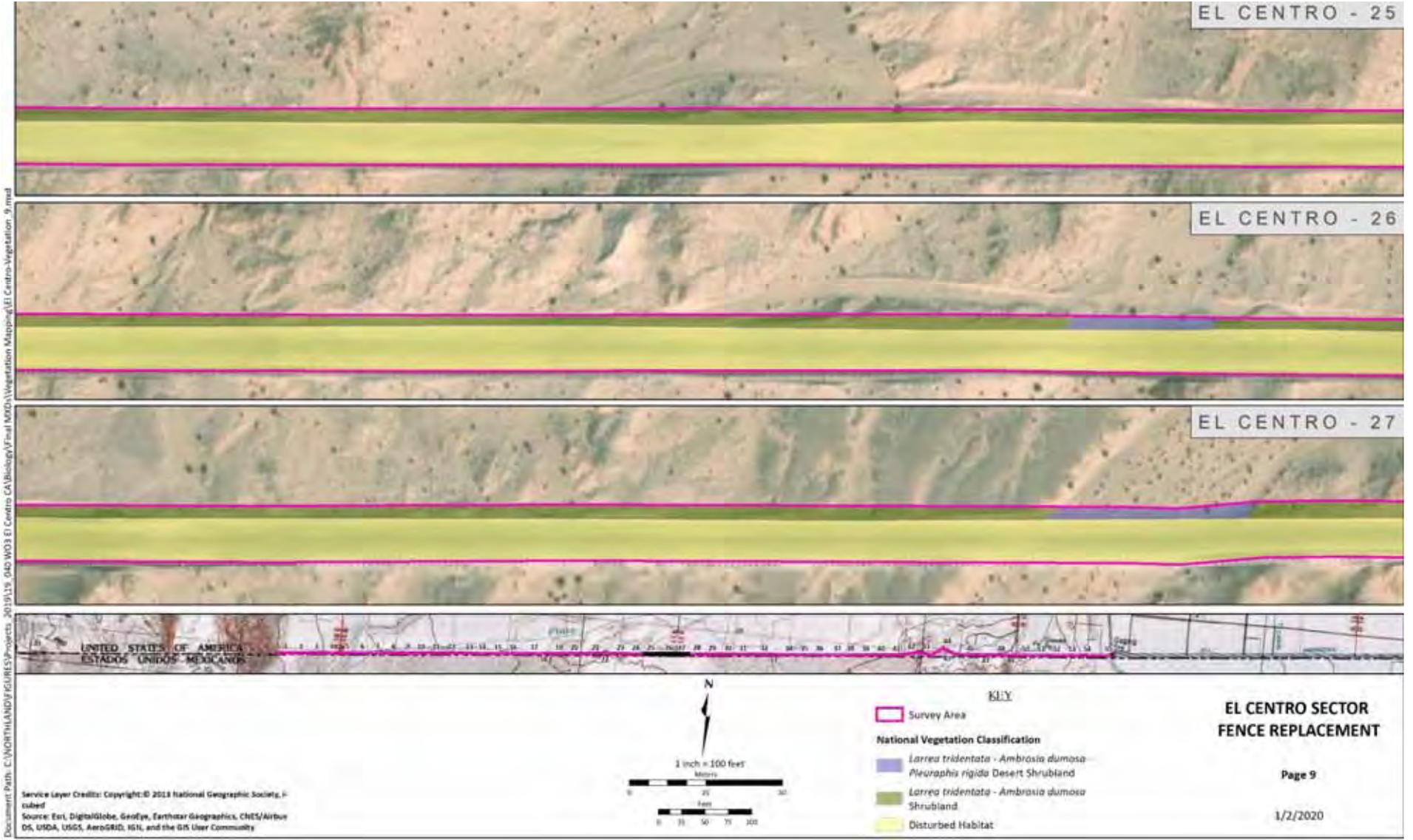


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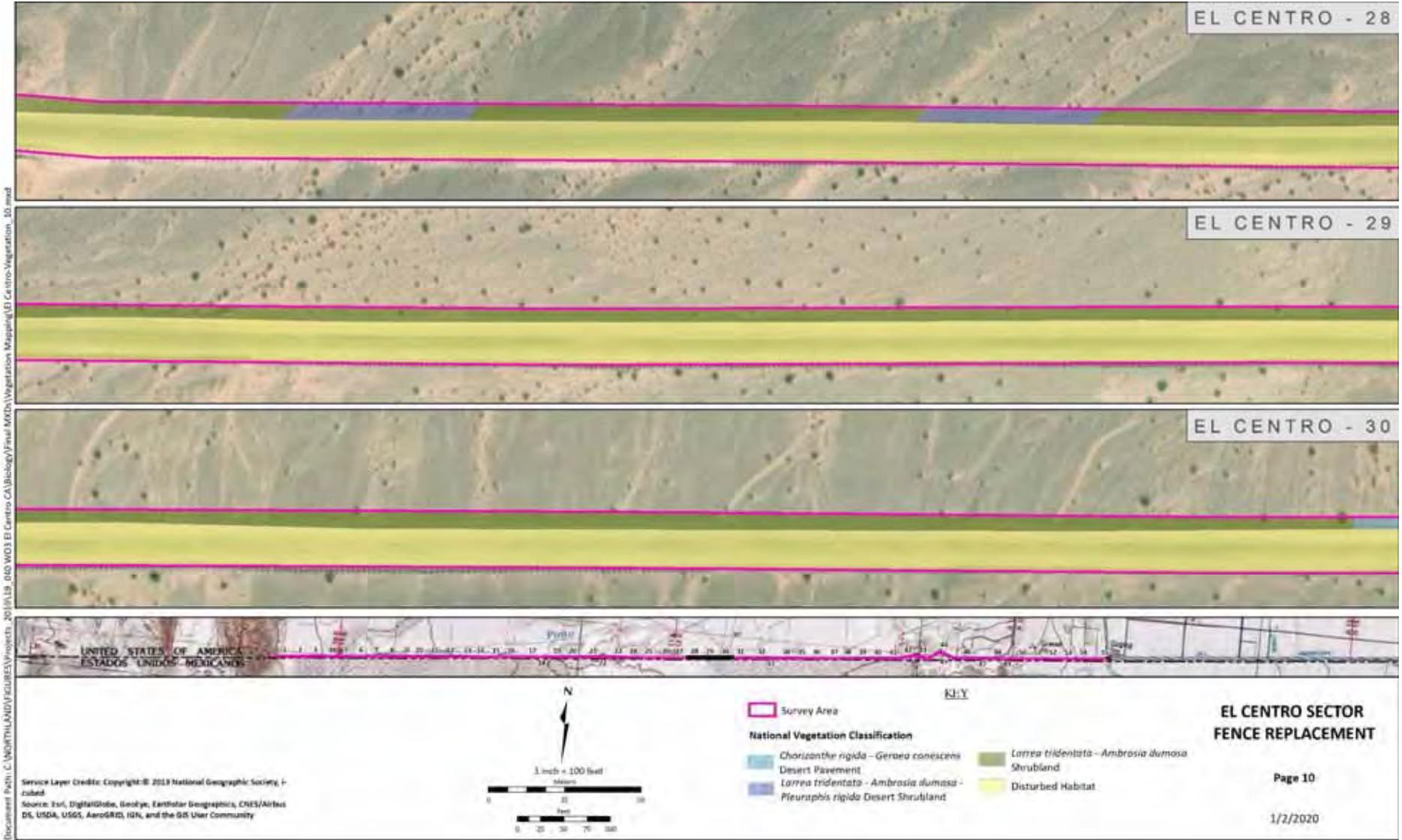


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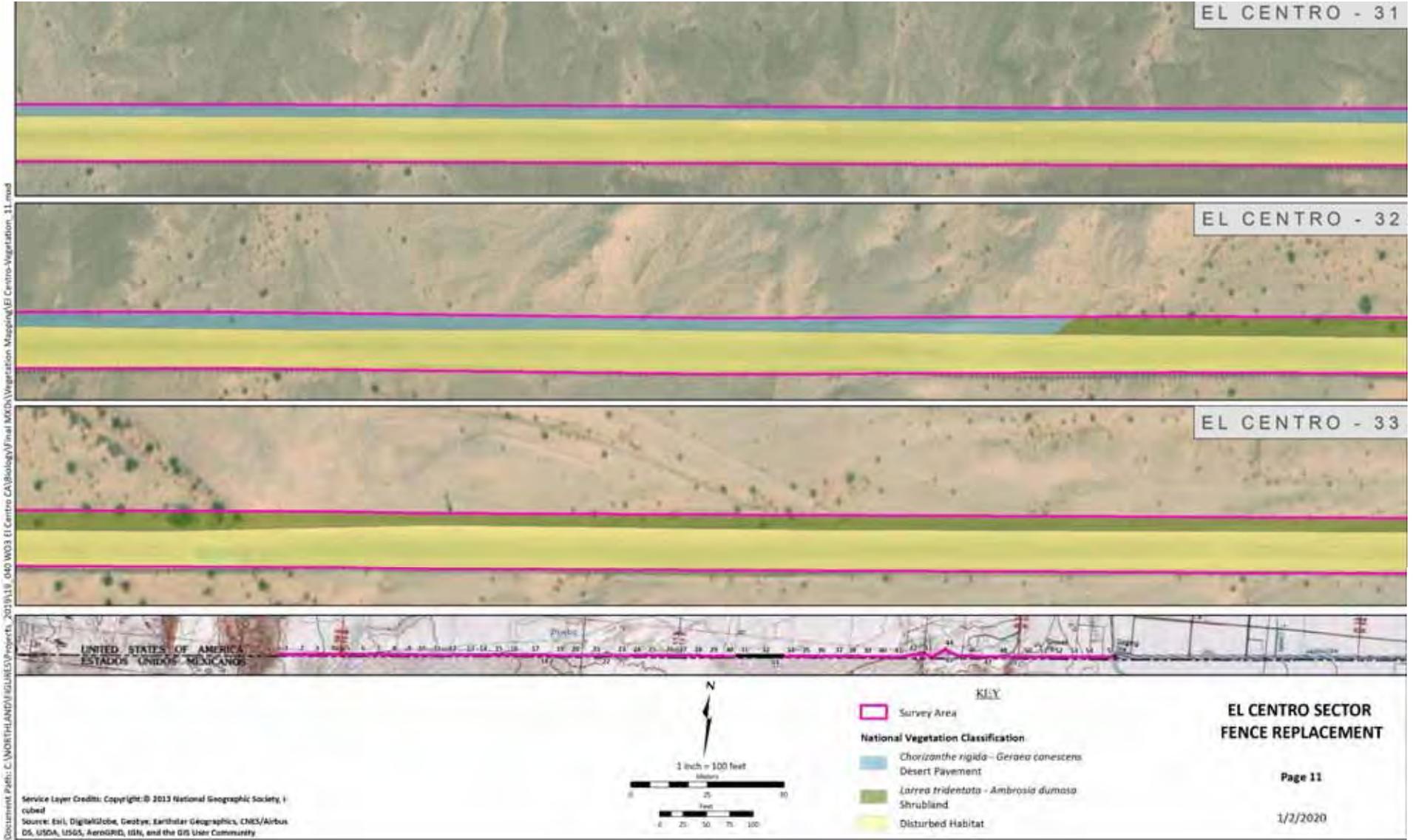


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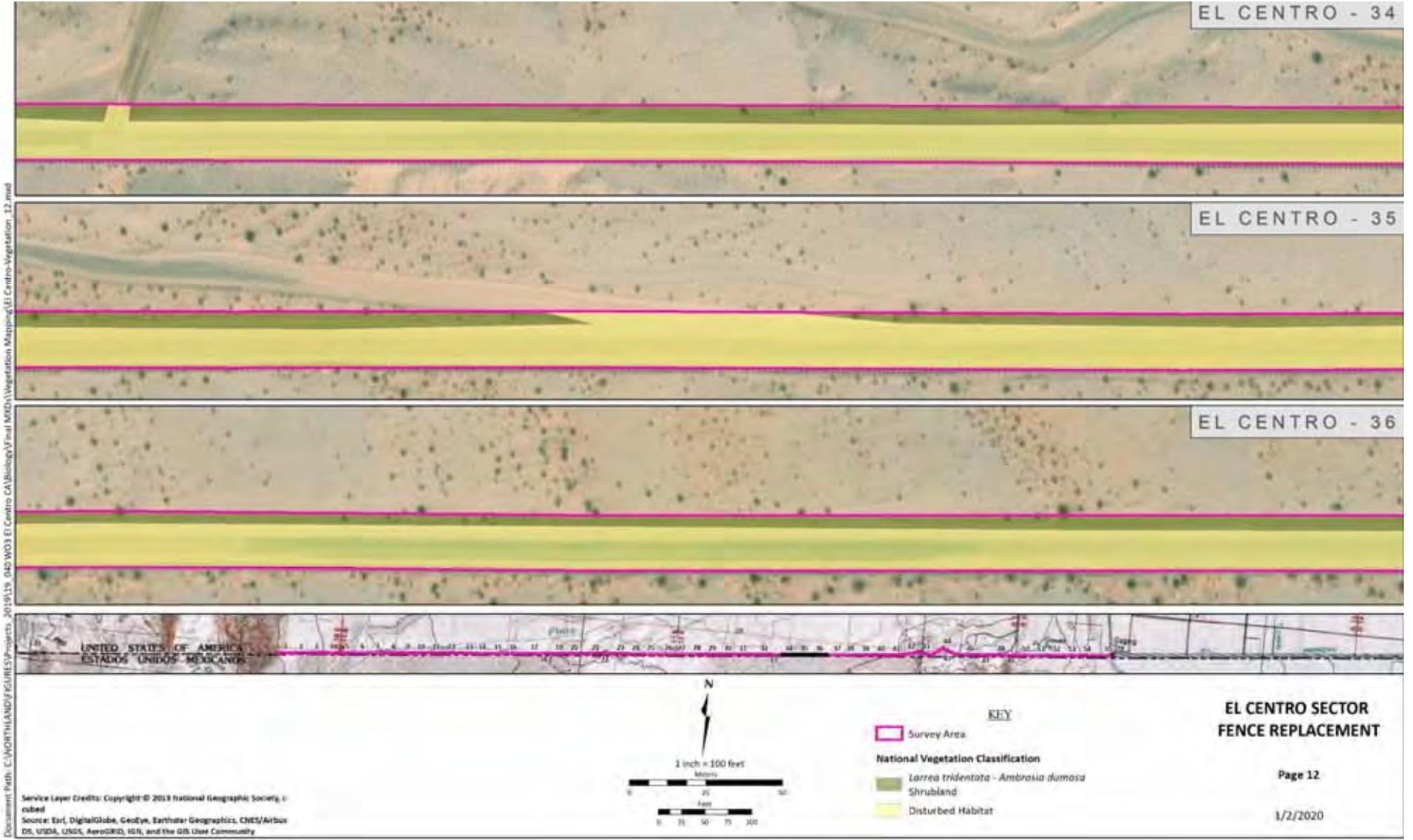


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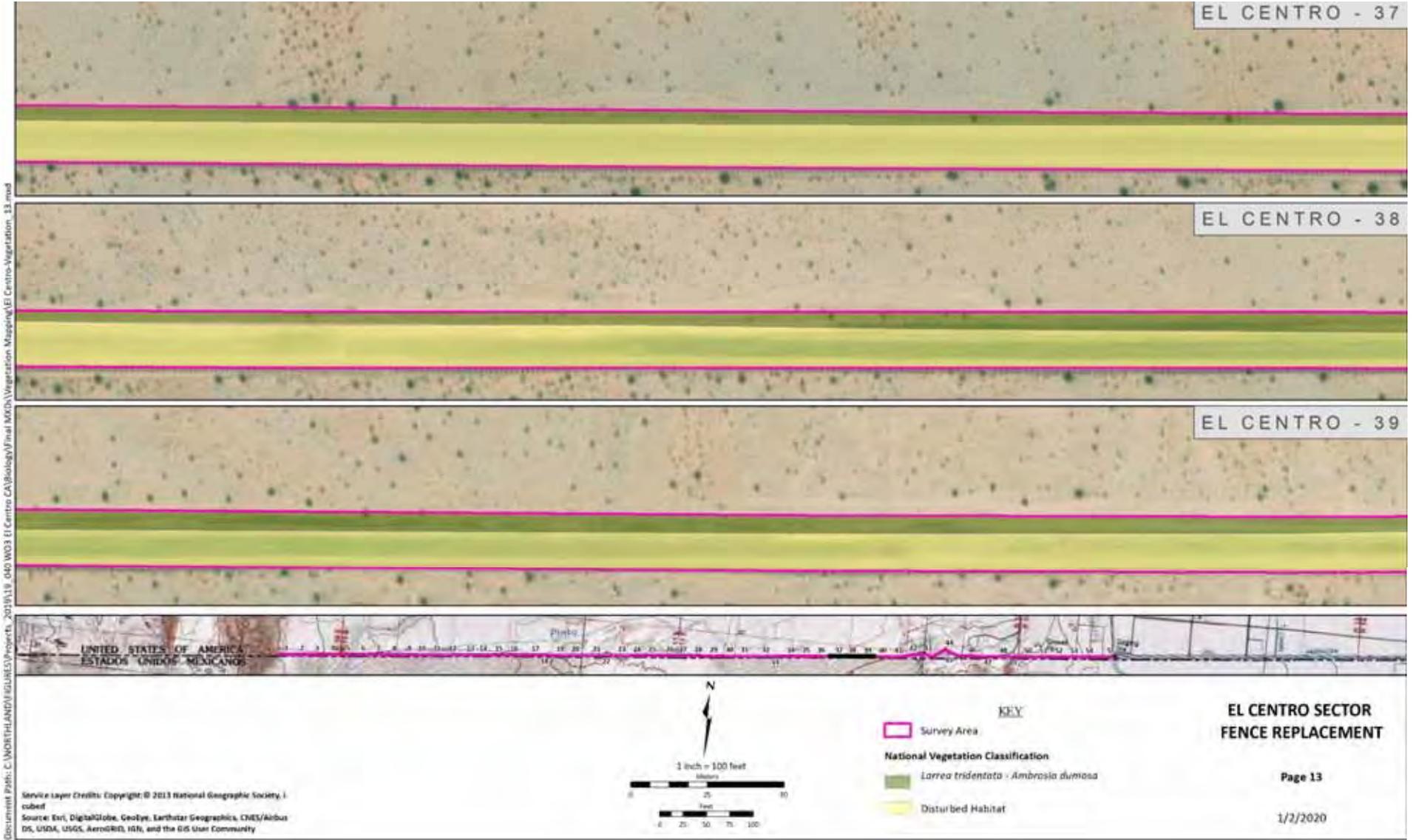


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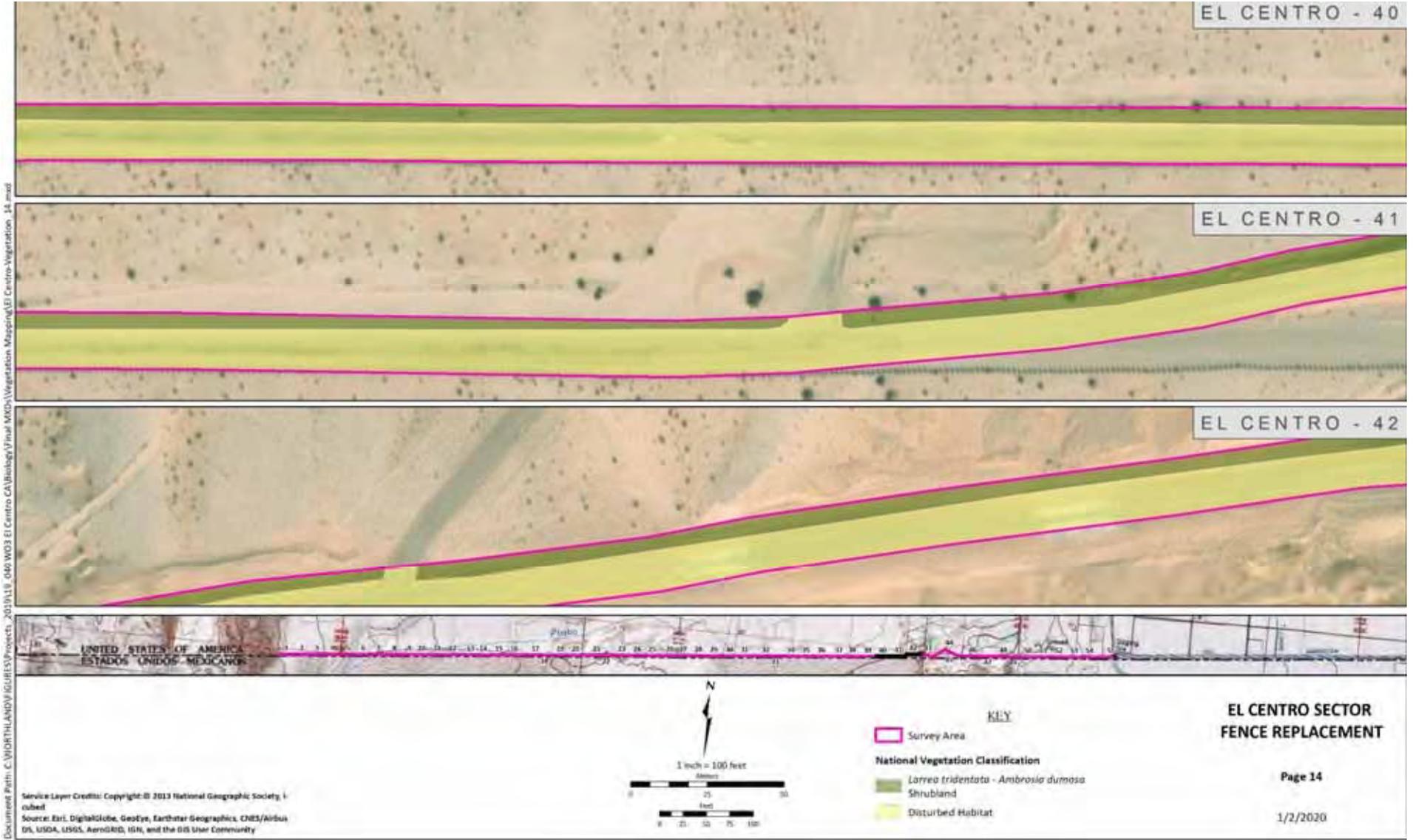


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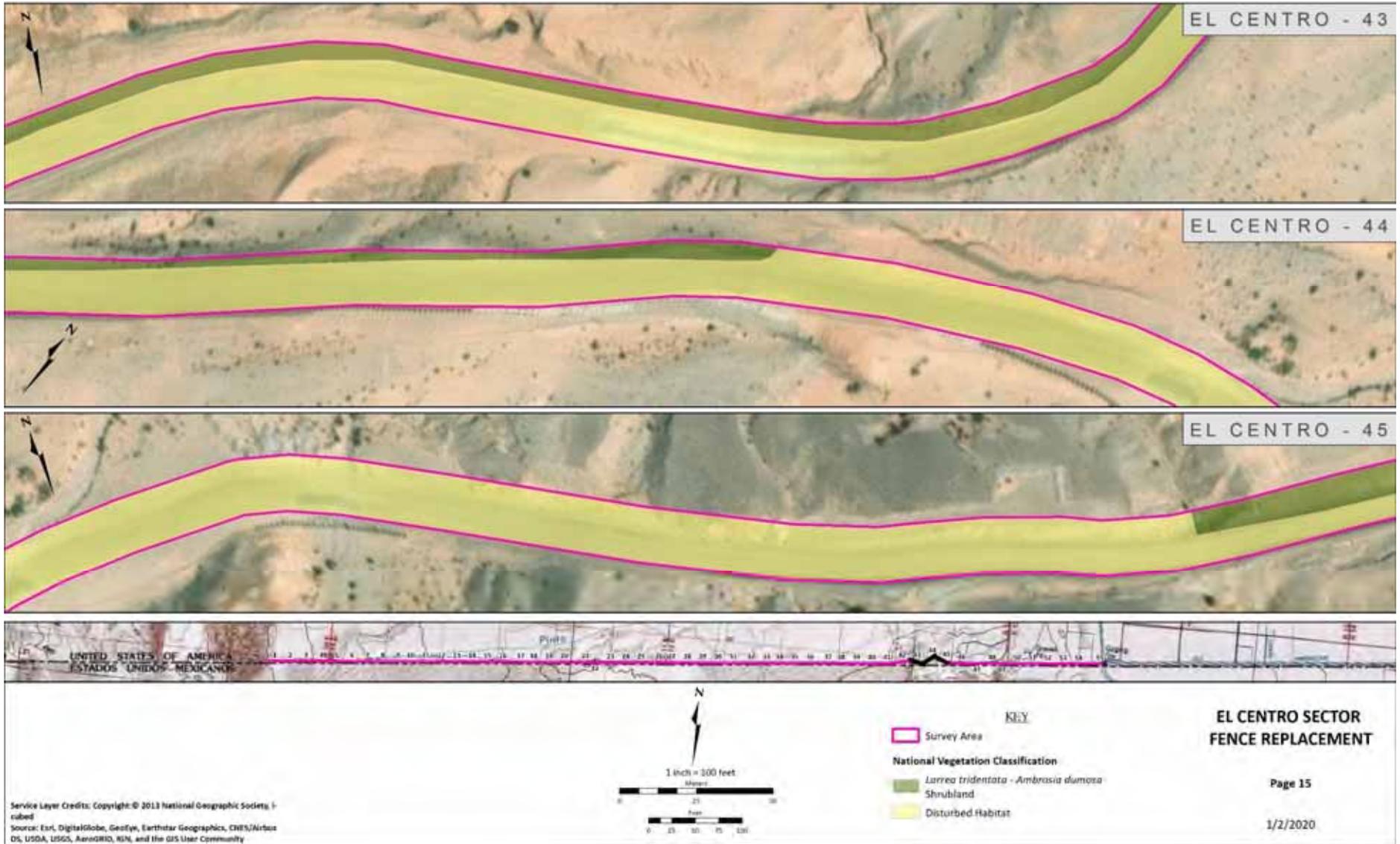


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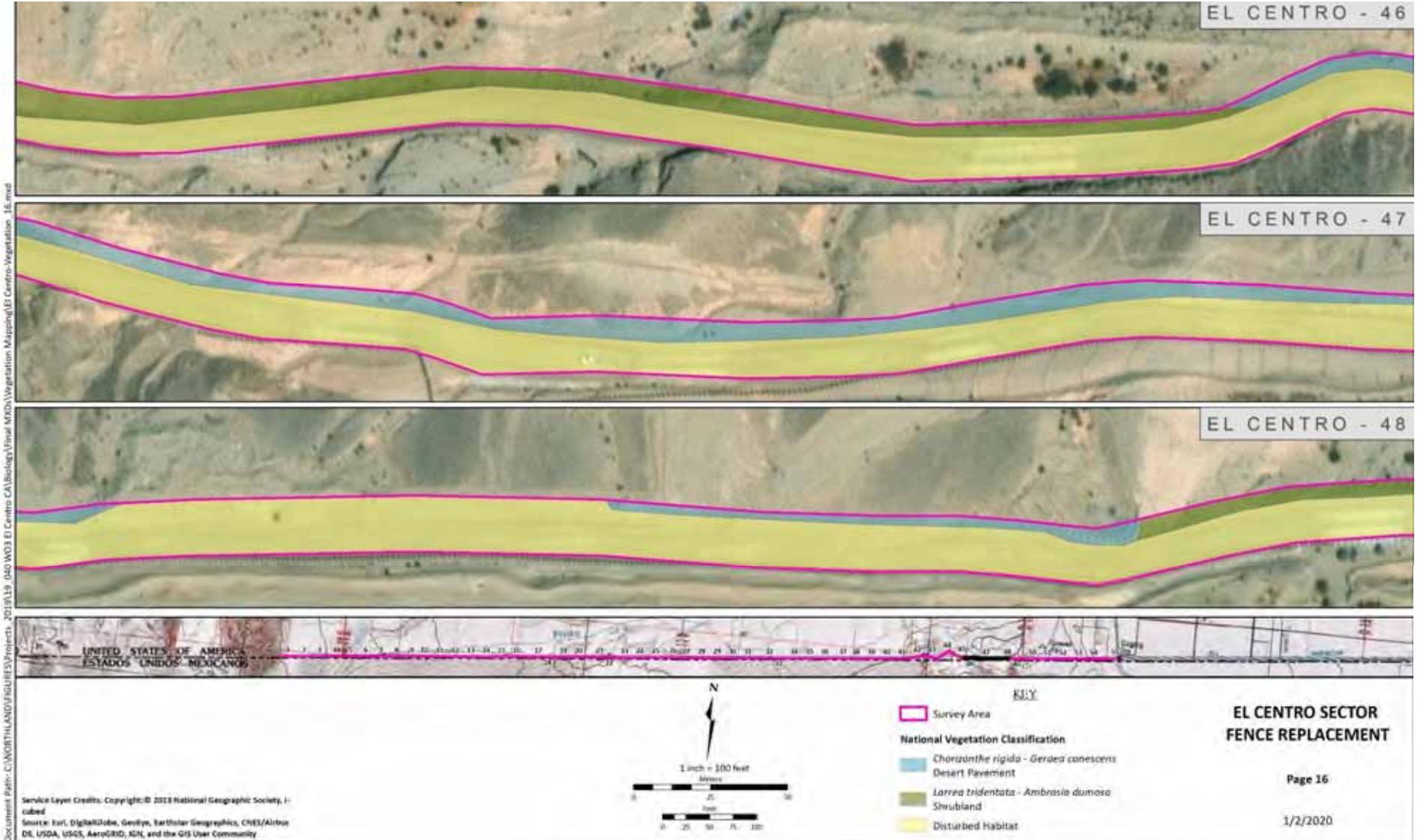


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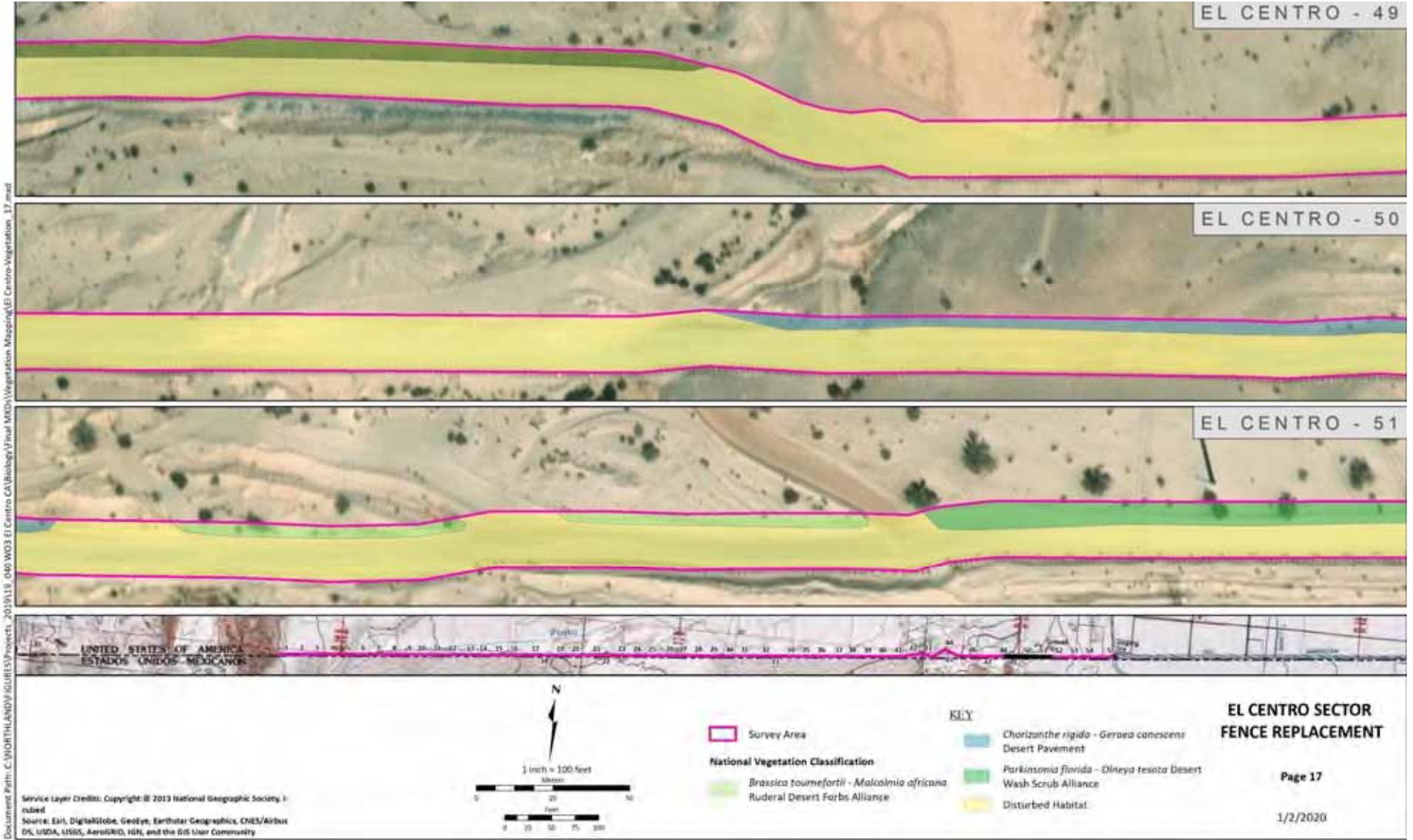


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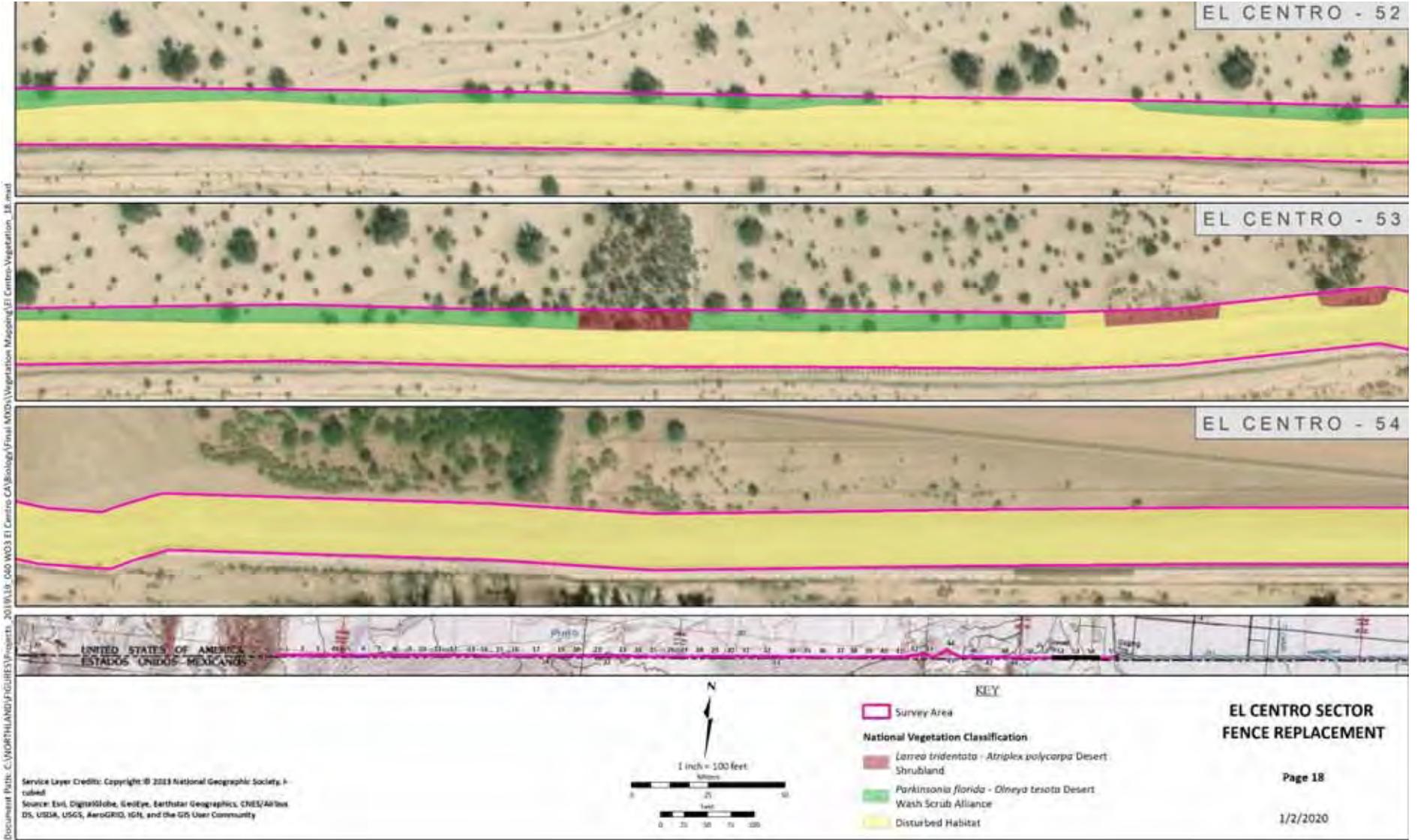


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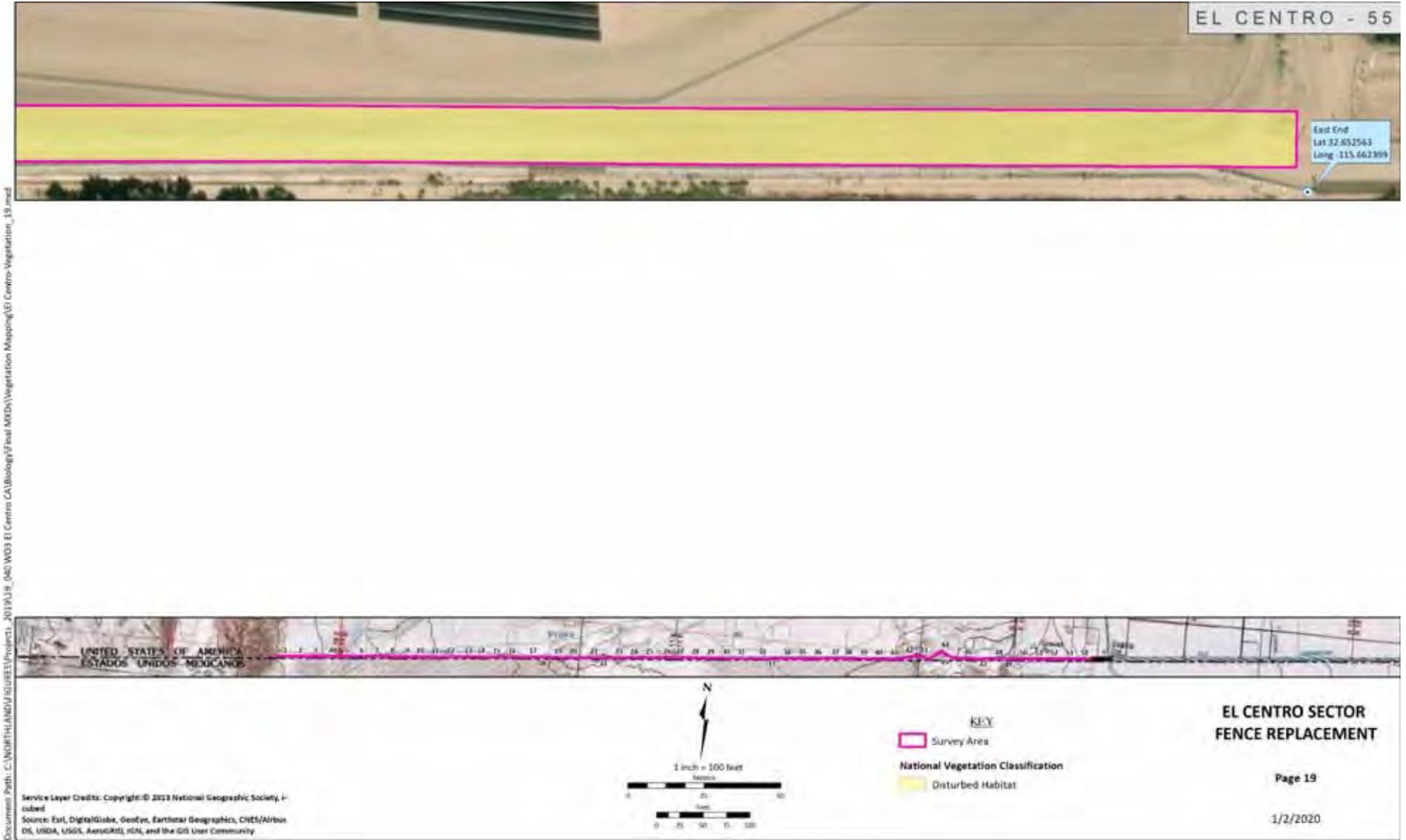


Figure 3

**Figure 4:
Soil Map**

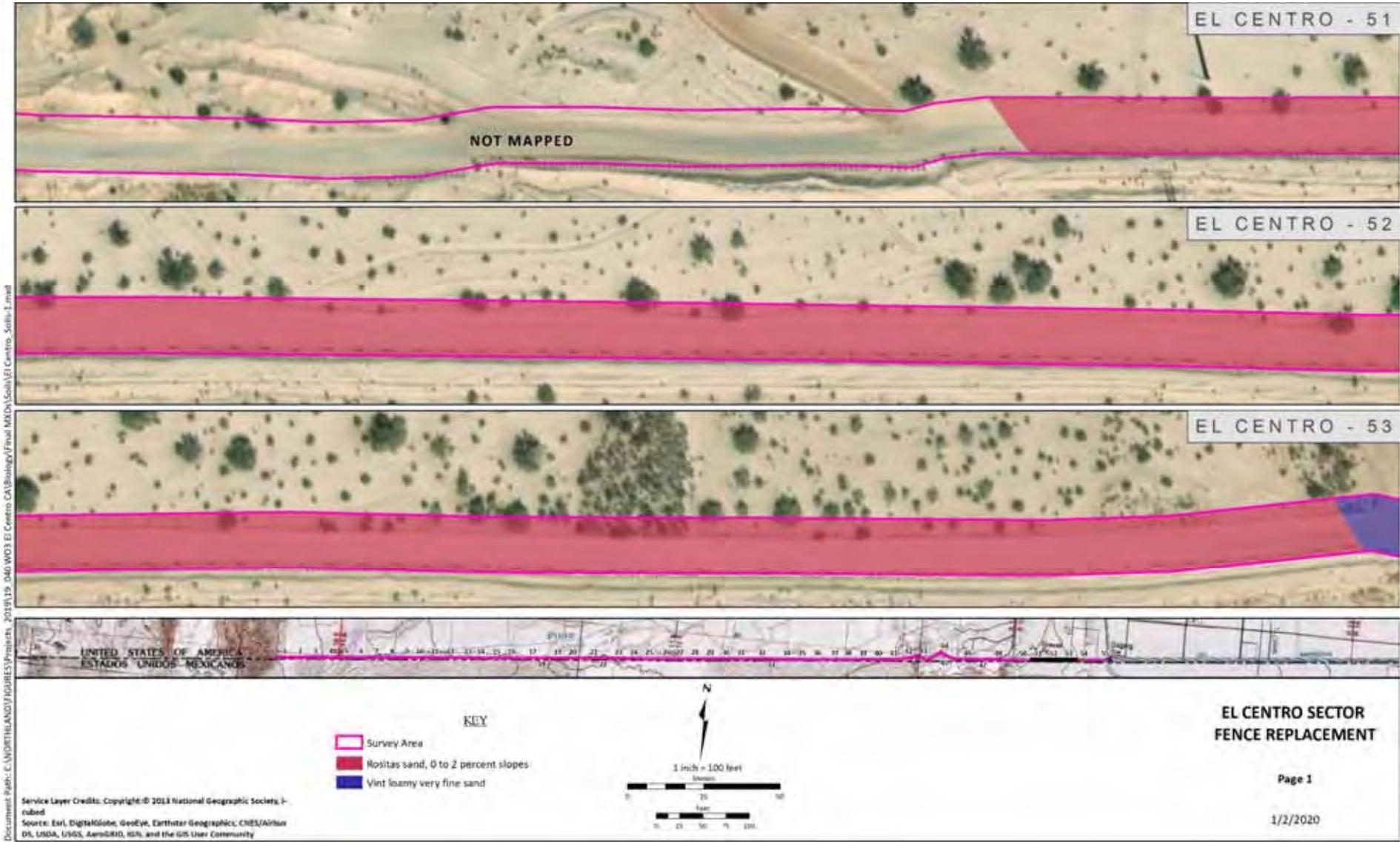
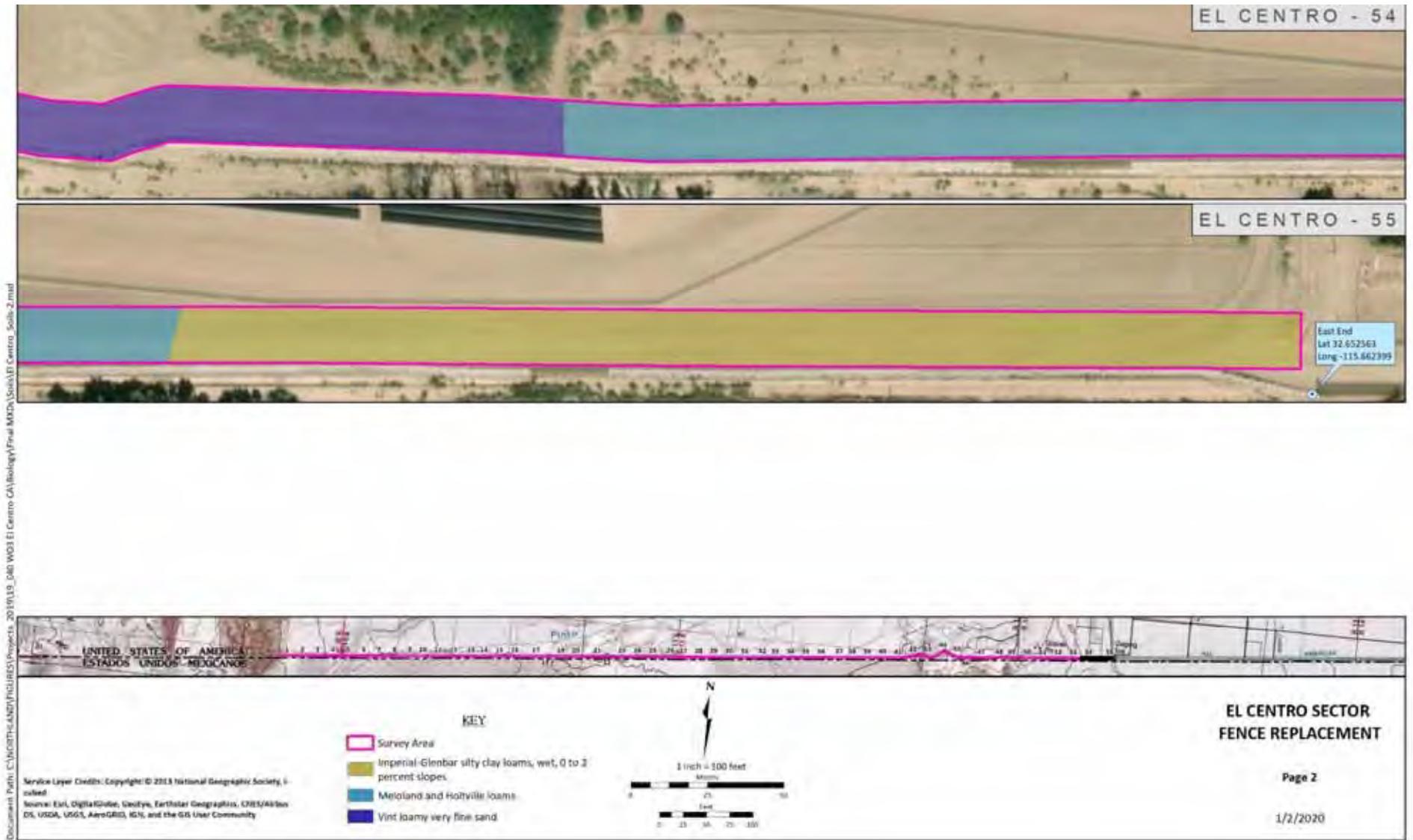


Figure 4



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Figure 4

**Figure 5:
Preliminary Section 404 Jurisdictional Assessment Areas Map**

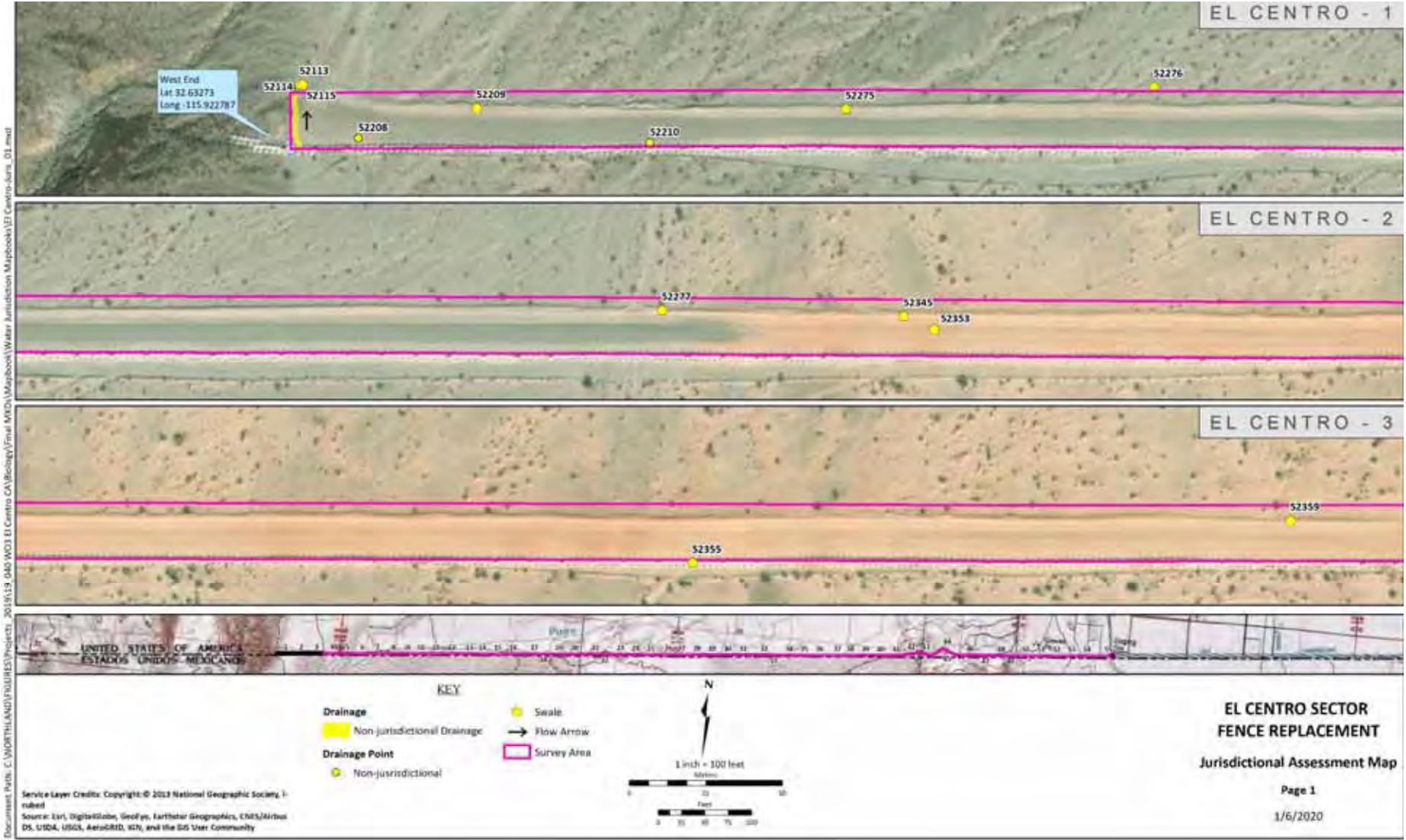


Figure 5

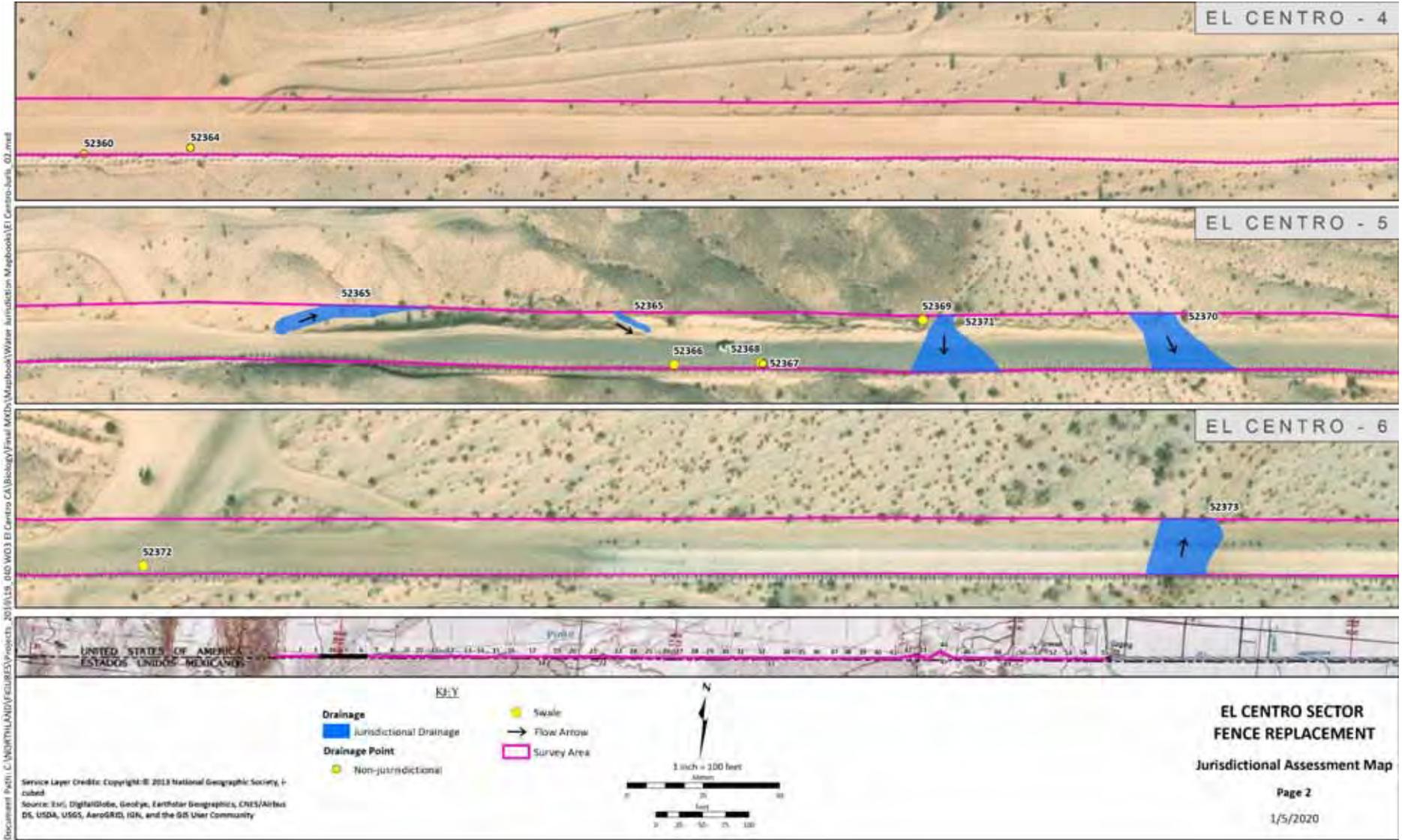


Figure 5

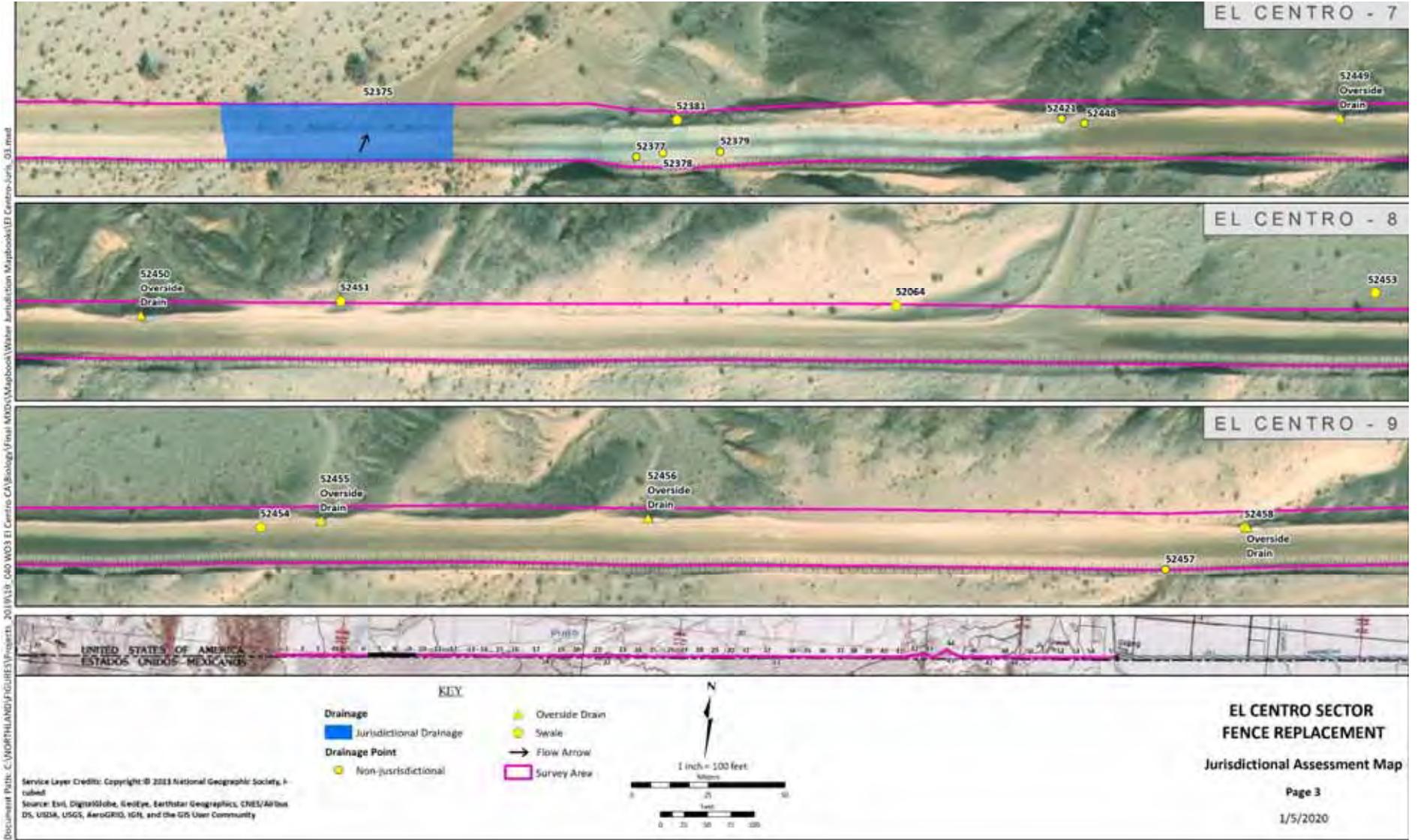


Figure 5



Figure 5



Figure 5



Figure 5

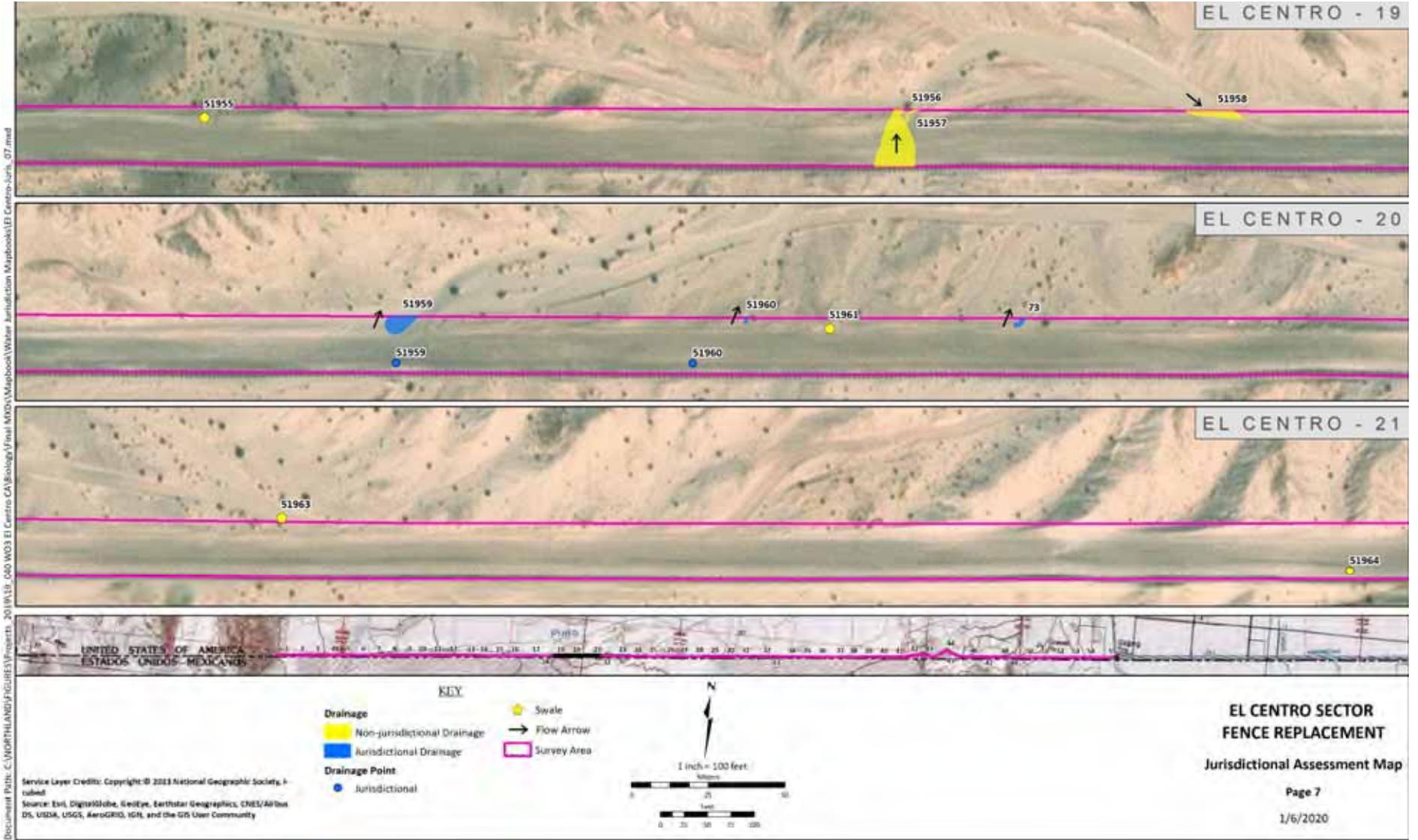


Figure 5



Figure 5

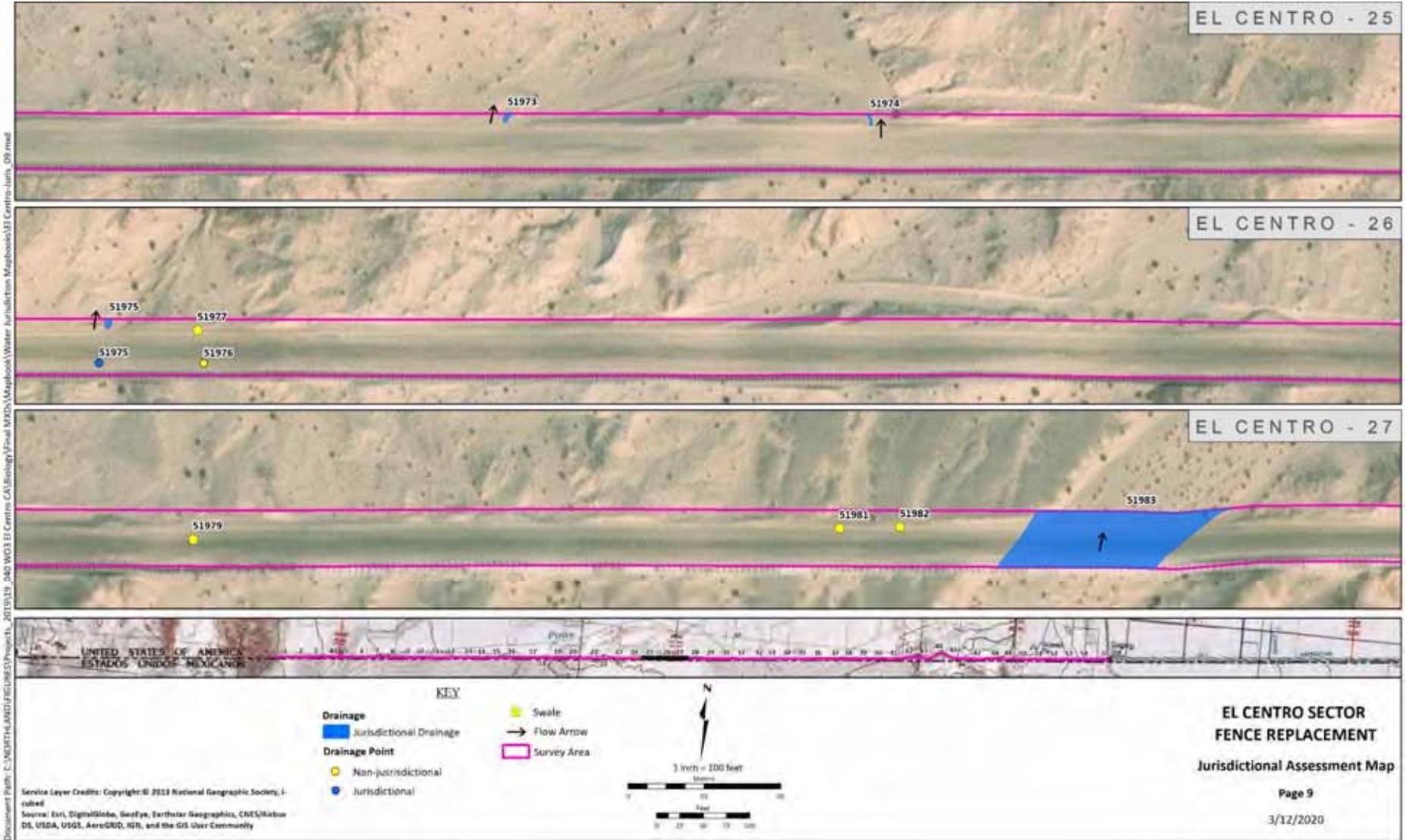


Figure 5

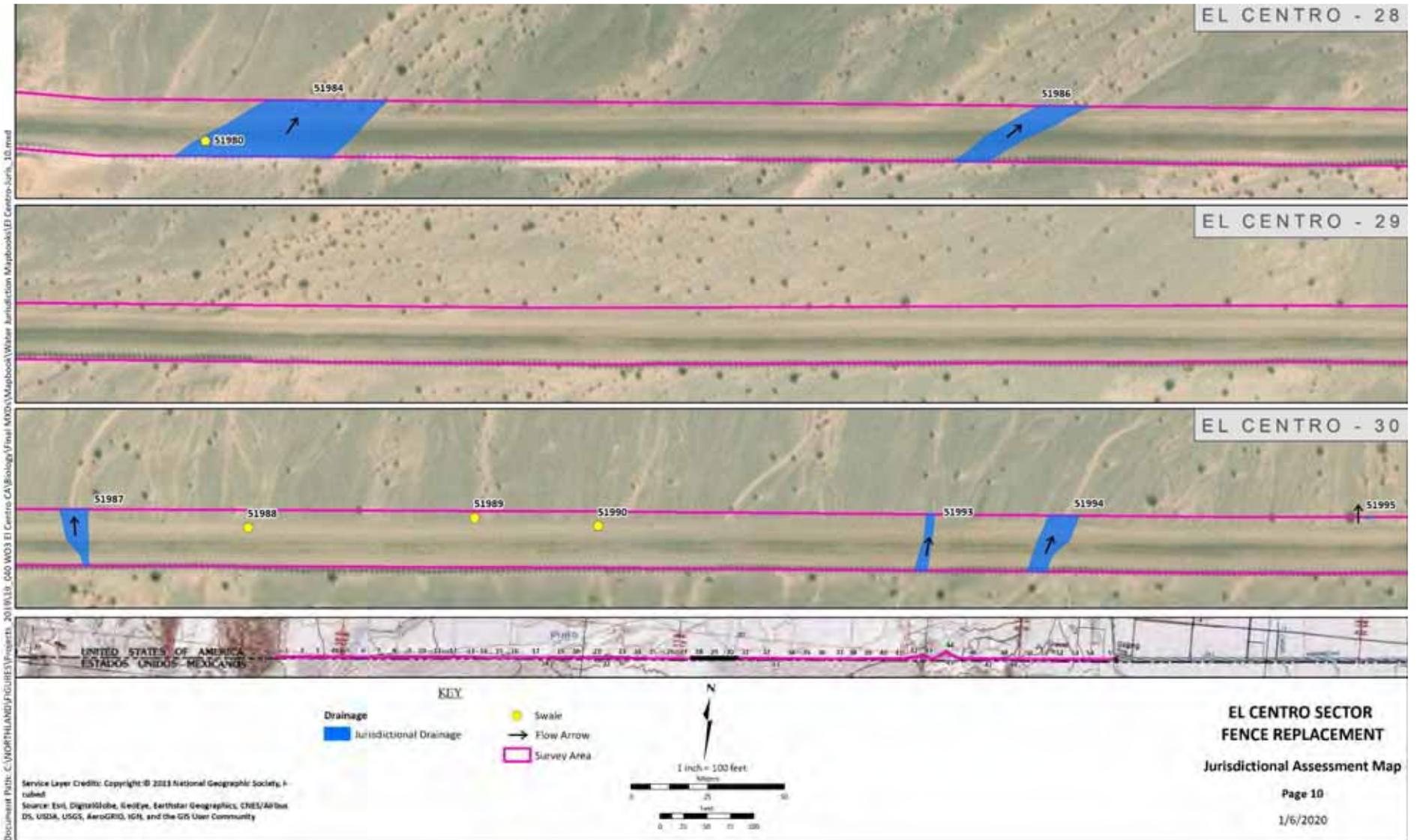


Figure 5

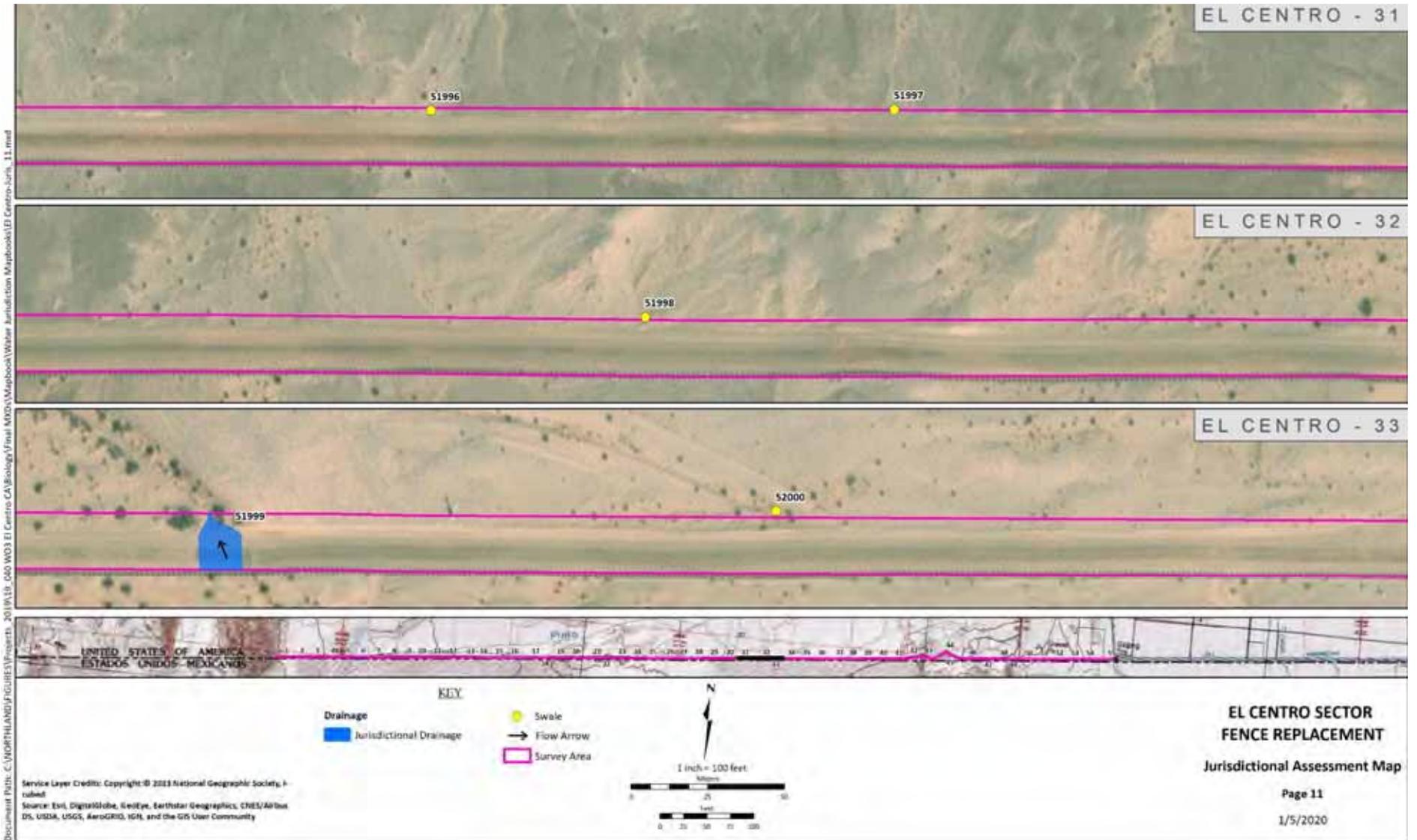


Figure 5

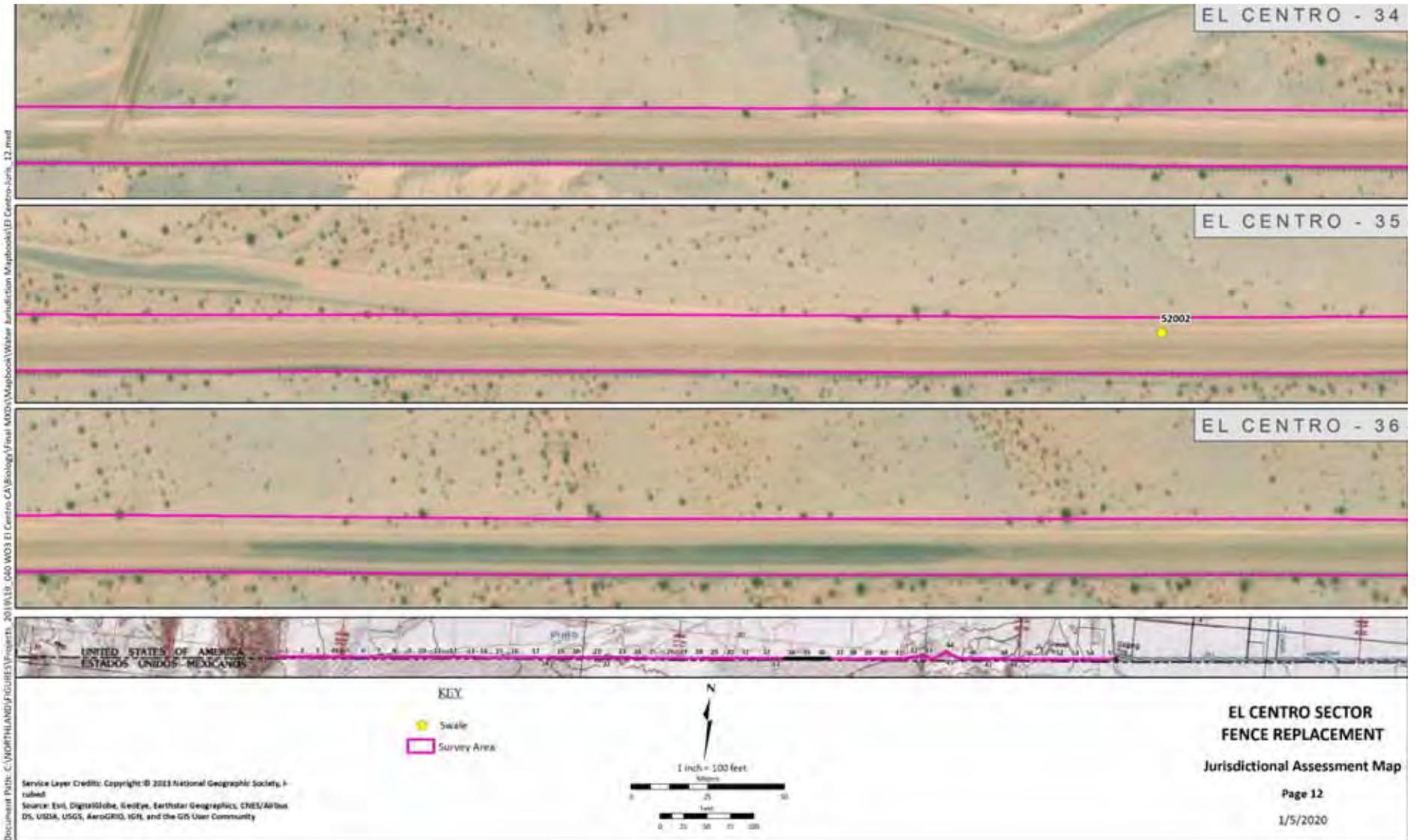


Figure 5

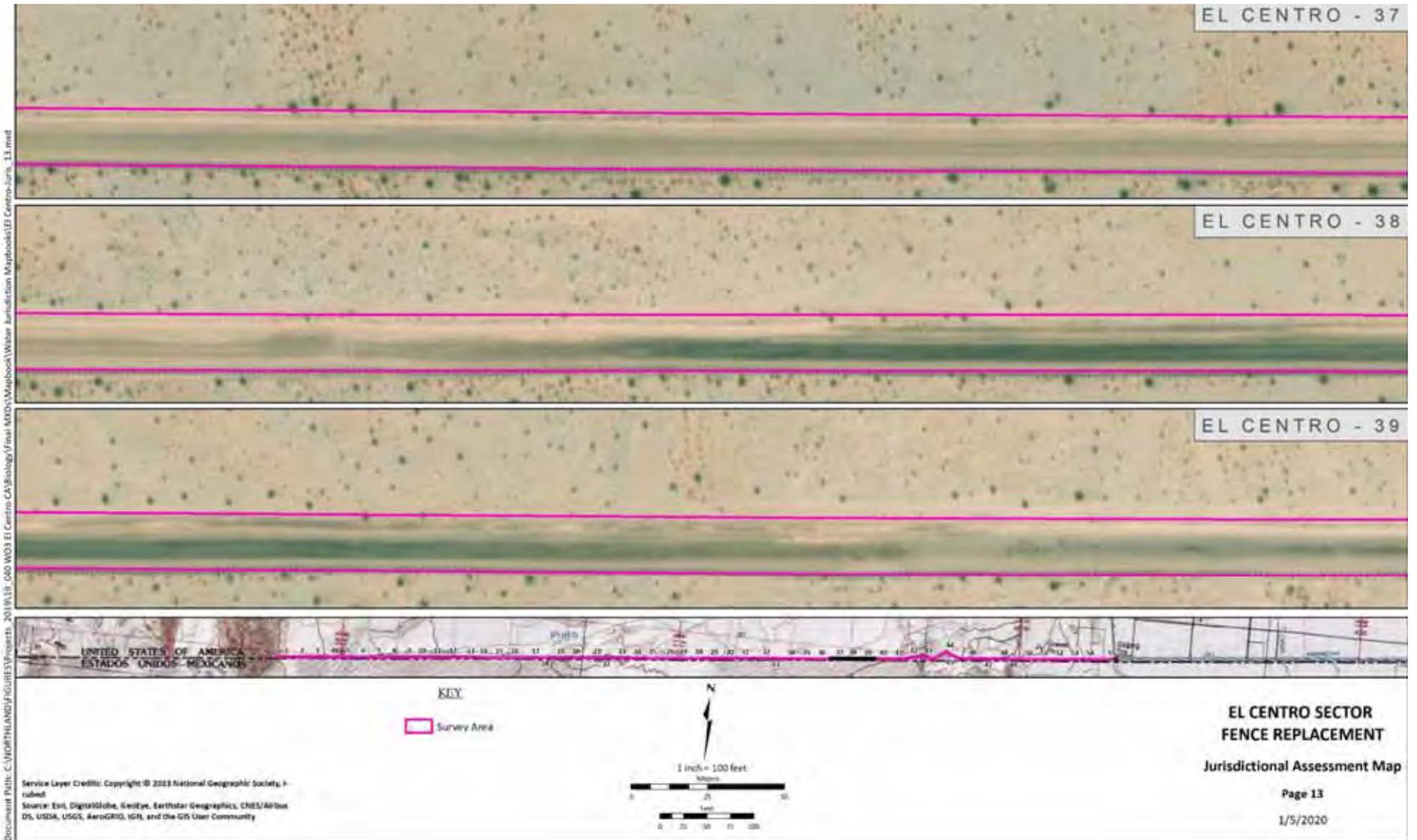


Figure 5

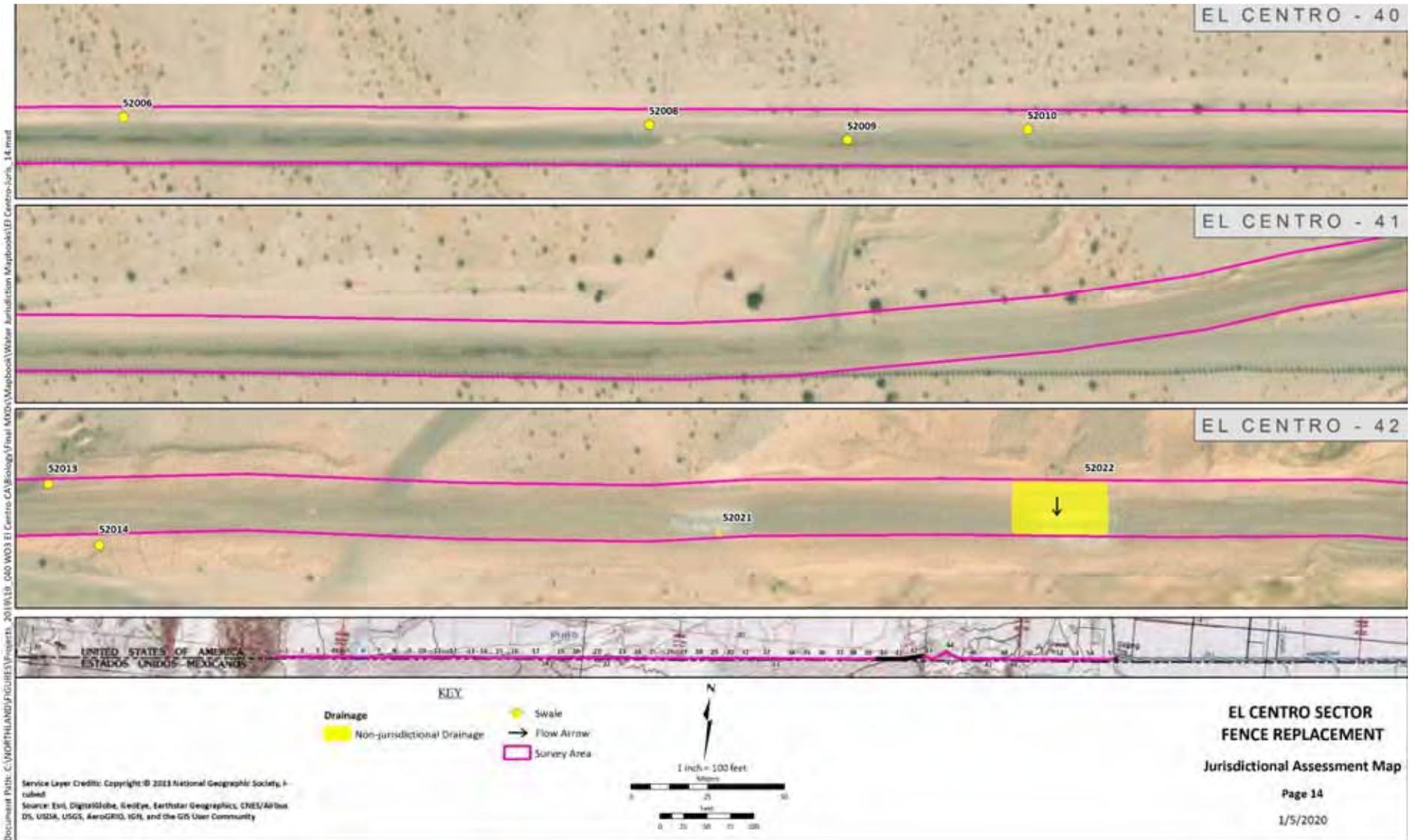


Figure 5

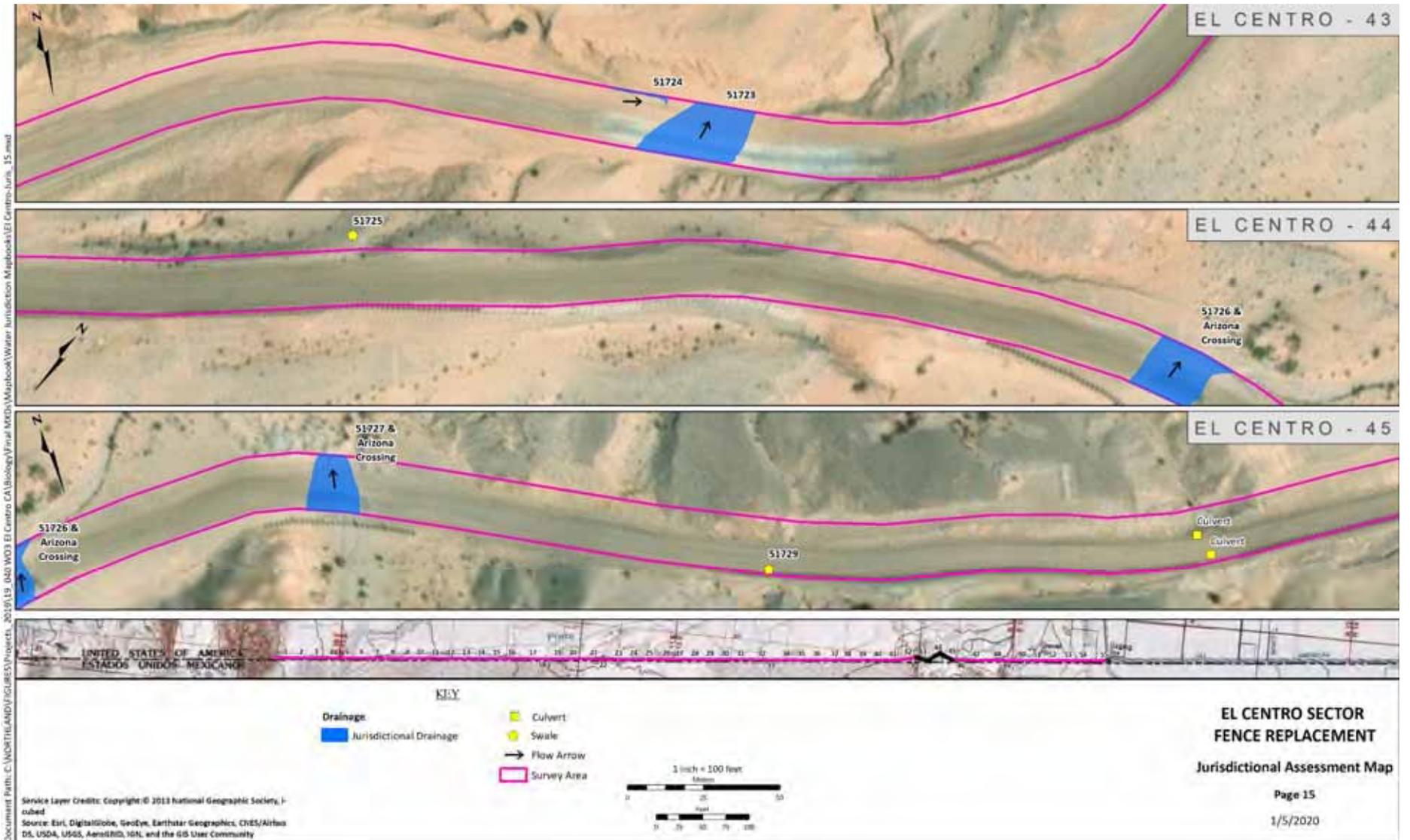


Figure 5

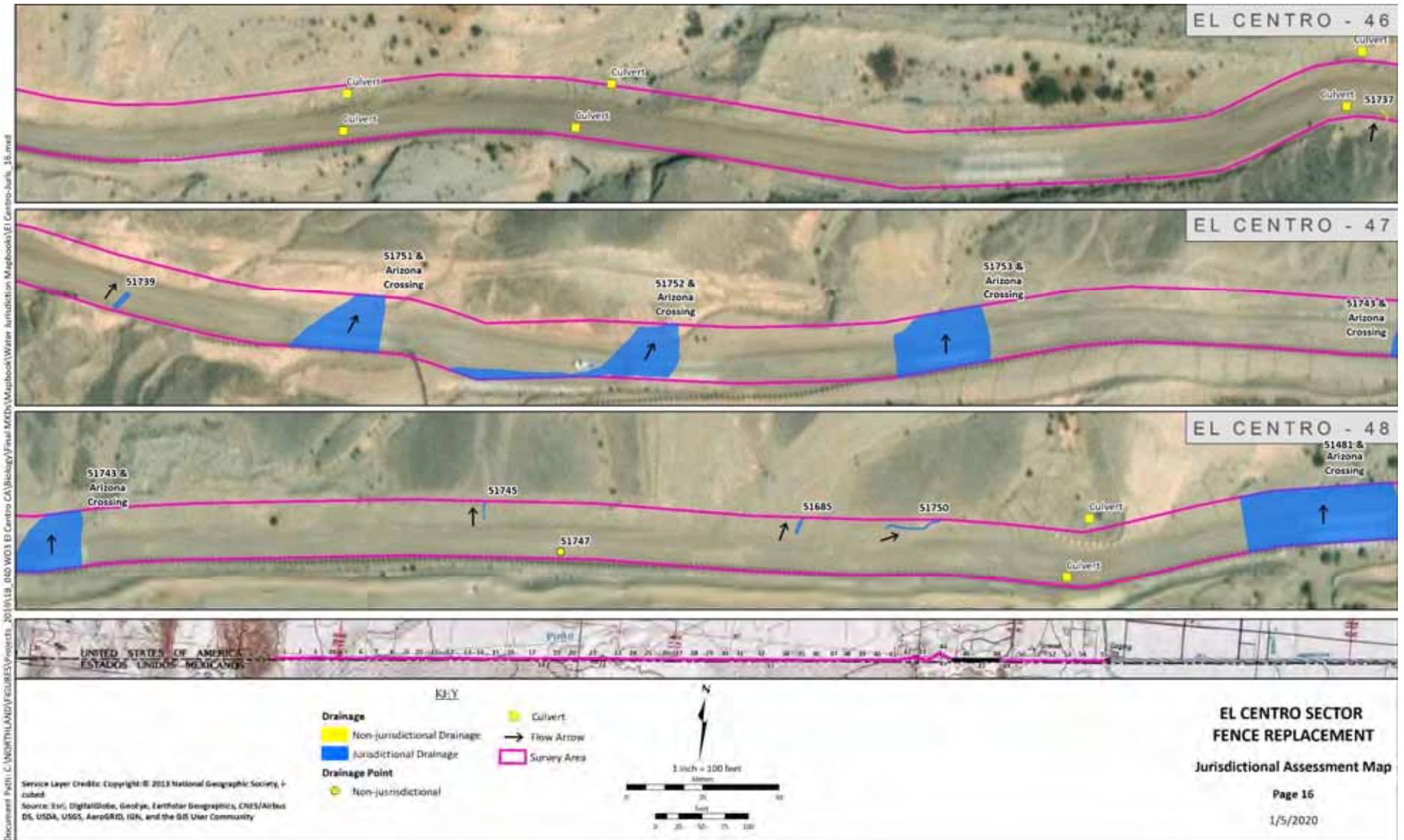


Figure 5

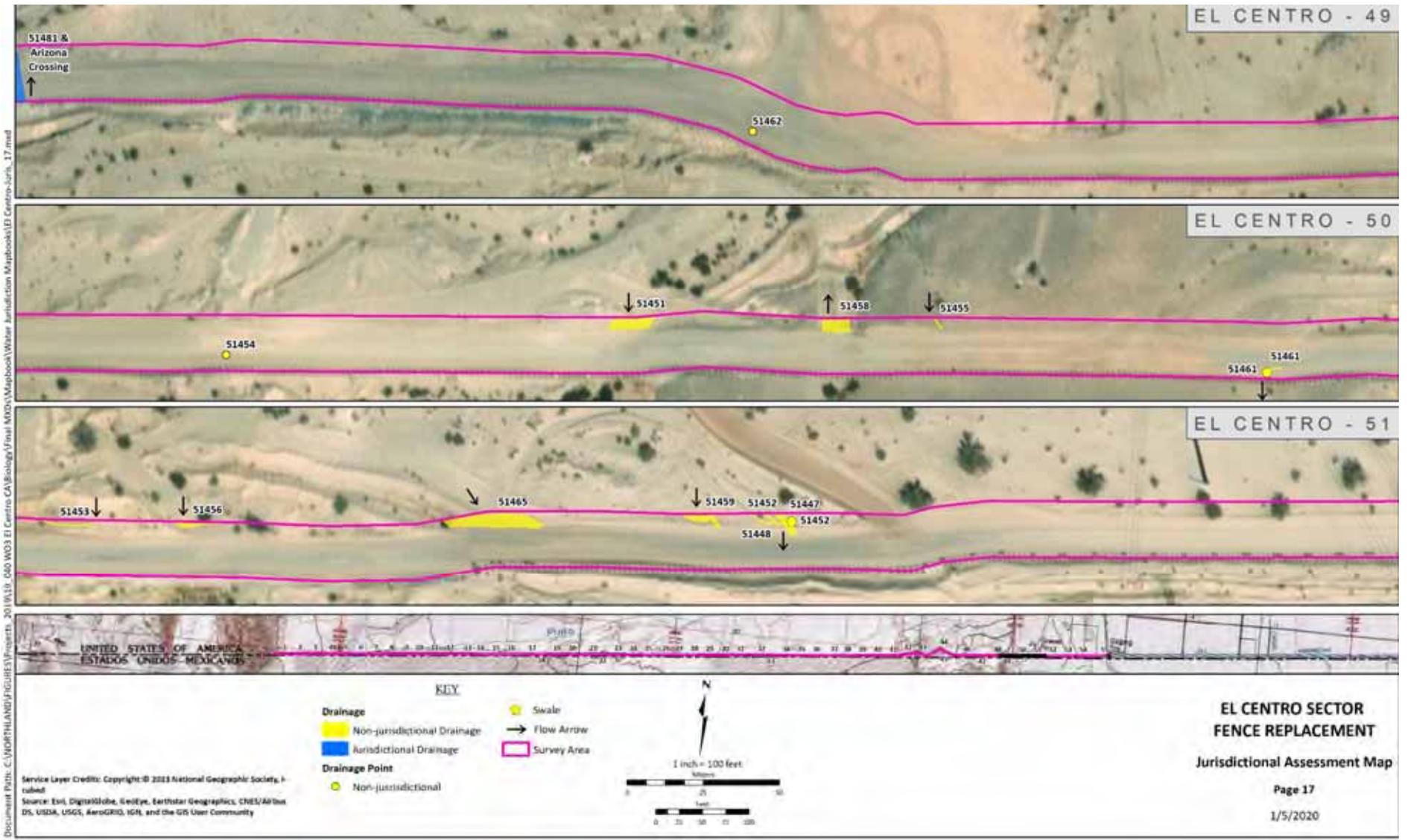


Figure 5

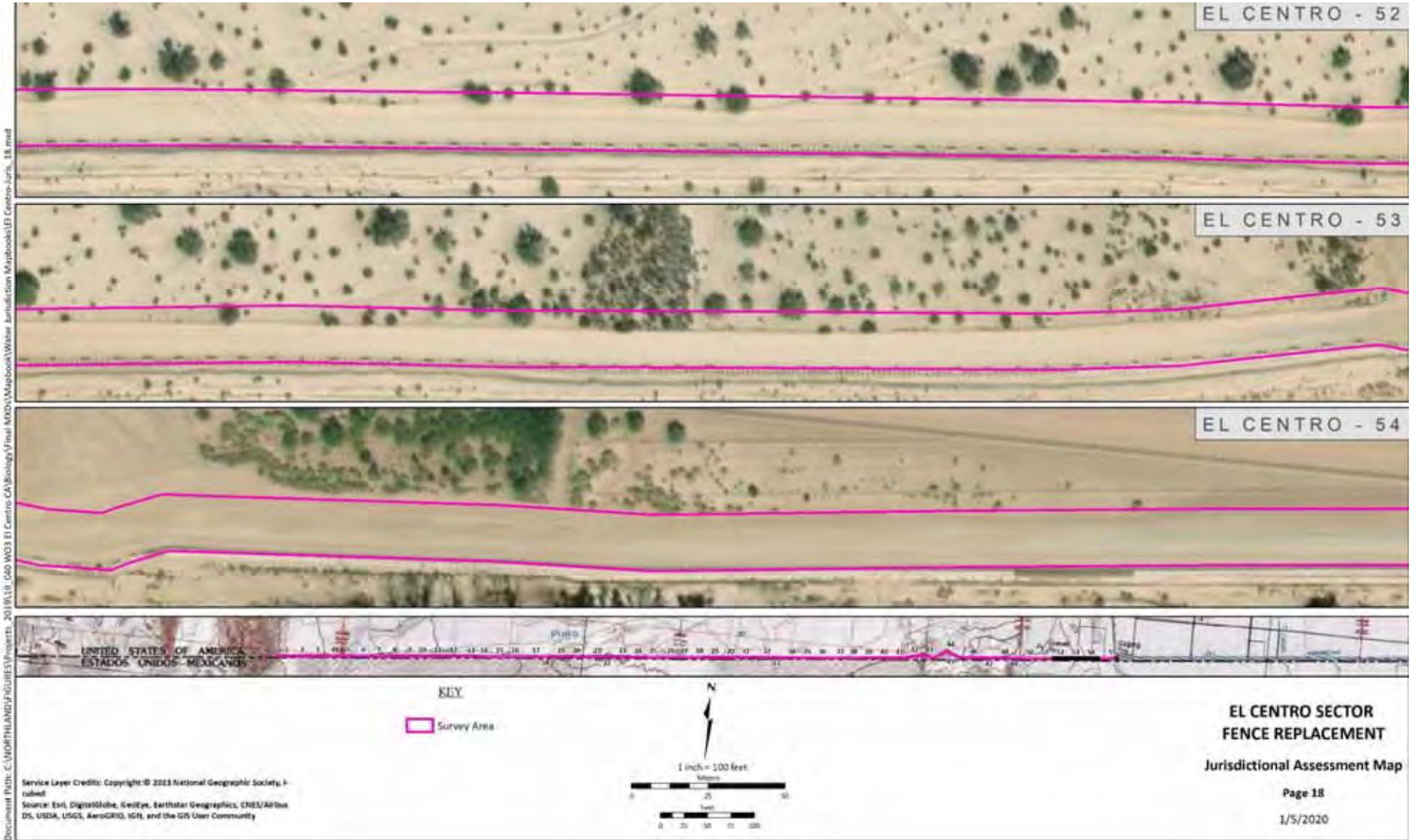


Figure 5

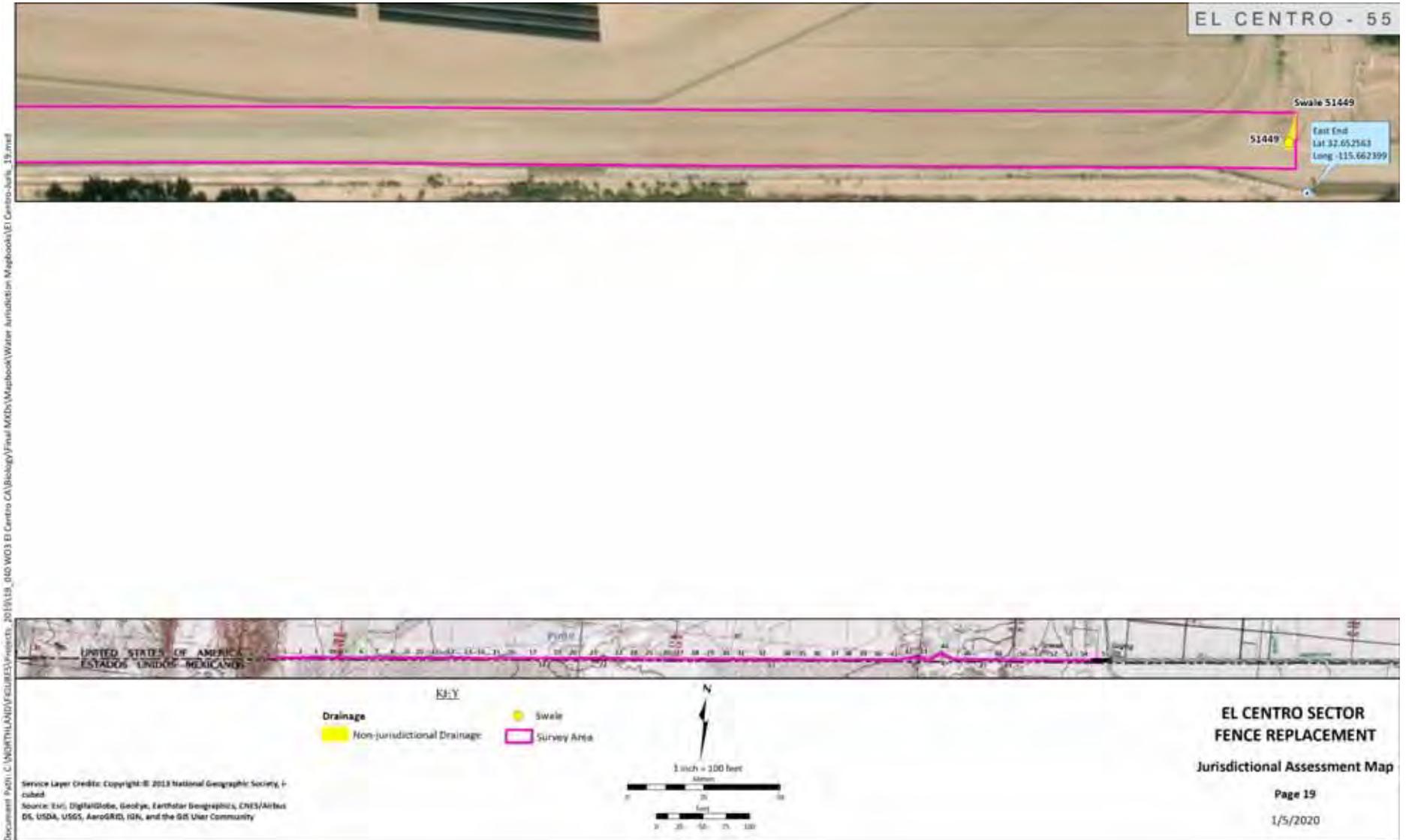


Figure 5

**Appendix A:
Photographic Log**

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51447
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	3
Cardinal direction	<input type="checkbox"/> East <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.651129,-115.683447
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	0
Feature Photo	



Notes Feature 3, 7ft wide

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51448
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	2
Cardinal direction	<input type="checkbox"/> East <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.651194,-115.683595
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	1
Feature Photo	



Notes 1ft wide,

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51449
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	1
Cardinal direction	<input type="checkbox"/> East <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.652705,-115.662482
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	28
Feature Photo	



Notes 8ft wide, concrete V ditch, filled with wind blown sand. Flowing south.

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51451
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	12
Cardinal direction	<input type="checkbox"/> East <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.650675,-115.688819
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	0
Feature Photo	



Notes

Outside Roosevelt reservation by 1-2ft. Looks to flow south. No culvert

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51452
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	4
Cardinal direction	<input type="checkbox"/> East <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.651135,-115.683407
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	1
Feature Photo	



Notes swale, 1ft. Old bed and bank not clearly defined, no other OHWM indicators. 3ft from rd cut

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51453
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	8
Cardinal direction	<input type="checkbox"/> East <input type="checkbox"/> North <input type="checkbox"/> South <input checked="" type="checkbox"/> West
Lat/Long	32.650877,-115.685955
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	1
Feature Photo	



Notes	8, 1ft wide
-------	-------------

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51454
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	1
Cardinal direction	<input type="checkbox"/> East <input type="checkbox"/> North <input type="checkbox"/> South <input checked="" type="checkbox"/> West
Lat/Long	32.650357,-115.693176
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	1
Feature Photo	



Notes

Feature on south side of fence, actual border strays from access road in this area. Area not surveyed on foot. Visual obstruction - berm.

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51455
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	10
Cardinal direction	<input type="checkbox"/> East <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.650738,-115.687702
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	1
Feature Photo	



Notes 10, 1.5 ft buffer

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51456
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	7
Cardinal direction	<input type="checkbox"/> East <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.650984,-115.685412
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	1

Feature Photo



Notes 7, mapped RL and RR. Ironwood and creosote in drainage. Disturbed at margin next to road. South flow

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51458
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	11
Cardinal direction	<input checked="" type="checkbox"/> East <input type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.650752,-115.688092
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Mapbook Page 1

Feature Photo



Notes Flowing south to north, erosional feature leading to drainage below.

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51459
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	5
Cardinal direction	<input type="checkbox"/> East <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.651103,-115.683810
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	1
Feature Photo	



Notes Finely braided wash, mapped rr and rl, highly disturbed, tire tracks.

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51461
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	9
Cardinal direction	<input type="checkbox"/> East <input type="checkbox"/> North <input checked="" type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.650745,-115.686544
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	0

Feature Photo



Notes Erosional rill under concrete block,
1ft wide

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51462
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	1
Cardinal direction	<input type="checkbox"/> East <input type="checkbox"/> North <input checked="" type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.650497,-115.690203
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	0
Feature Photo	



Notes Feature on south side of fence

JD Feature Photo Log

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51464
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	1
Cardinal direction	<input type="checkbox"/> East <input type="checkbox"/> North <input type="checkbox"/> South <input checked="" type="checkbox"/> West
Lat/Long	32.650670,-115.693428
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	0
Feature Photo	



facing east



facing north

Notes

Heavily disturbed road margin with riprap, feature more than 20ft from road edge.

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51465
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	6
Cardinal direction	<input type="checkbox"/> East <input checked="" type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> West
Lat/Long	32.651017,-115.684521
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Mapbook Page	0
Feature Photo	





facing east, sheet flow over road.

Notes

6, Mapped rl and rr, road spur bisecting middle of feature, heavily disturbed. Sheet flow over road, no visible output at vehicle barricade (fence)

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51481
Survey Date	07/09/2019
User	Lindsay Willrick
Feature Name	F15-N
Lat/Long	32.650300,-115.695664
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



west



west



west



west



west



south, upstream bed and bank

Notes

Arizona crossing, riprap on both north and south edges of crossing, flowing north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51664
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Culvert inlet, double 2.5'
Lat/Long	32.649038,-115.710832
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

No access for better photo, can't cross vehicle barrier.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51675
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Culvert outlet
Lat/Long	32.649477,-115.709070
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

Two ft wide

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51676
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Culvert outlets, double, each 10'
Lat/Long	32.649505,-115.708132
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



10' each, south



Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51677
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.650797,-115.713952
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes Swale, no recent sign of OHWM.
Filled in with windblown sand

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51680
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Culvert outlet
Lat/Long	32.649381,-115.710907
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east



south

Notes

Double culvert 2.5'

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51681
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Culvert outlet
Lat/Long	32.649806,-115.705584
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

Outlet, 2ft wide. South to north flow.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51685
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	17, 3 ft buffer and then 1ft
Lat/Long	32.650165,-115.697828
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

South to north flow.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51710
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Culvert inlet
Lat/Long	32.649666,-115.705506
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Culvert inlet, 2'

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51723
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	44
Lat/Long	32.648737,-115.720033
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south



south



north



north

Notes

Arizona crossing, feature extends north and south of rd. Flows south to north, ponds in road a bit.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51724
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	43
Lat/Long	32.648834,-115.720183
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northwest



west



west

Drainage flowing west to east,
somewhat parallel north side of
road.

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51725
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.649281,-115.717347
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

Swale, no OHWM

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51726
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	41
Lat/Long	32.650117,-115.700519
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

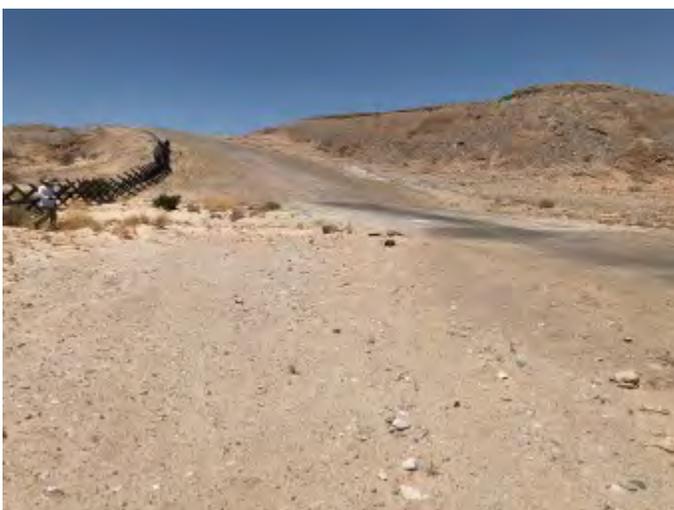
Feature Photo



south



south





Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51727
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	40
Lat/Long	32.650458,-115.713614
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



southeast



south



large culvert 20'± south of barricade



north



northeast

Notes

Arizona crossing. Natural drainage on both sides of road

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51729
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Concrete swale under and south of barricade.
Lat/Long	32.649683,-115.712237
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



west



east

Notes Shotcrete and cobble 4' wide feature parallel road.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51732
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Culvert inlet
Lat/Long	32.649300,-115.708949
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

2 ft wide

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51733
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Culvert inlet, double both 10'
Lat/Long	32.649343,-115.708192
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



Notes

No barricade in area, didn't enter drainage.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51735
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Arizona crossing, no feature
Lat/Long	32.649605,-115.707581
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east



east



east



southeast



south



east



east, shotcrete and cobble drainage on south edge of rd.

Notes

No outlet for this area, no OHWM.
AZ CROSSING in place, no feature.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51736
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Arizona crossing, no feature
Lat/Long	32.649605,-115.707581
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east



east



east



southeast



south



east



east, shotcrete and cobble drainage on south edge of rd.

Notes

No outlet for this area, no OHWM.
AZ CROSSING in place, no feature.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51737
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	34
Lat/Long	32.649657,-115.705483
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South to north, connects to culvert and shotcrete pooled area. No OHMW connecting feature and culvert.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51739
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	32
Lat/Long	32.649552,-115.705077
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south



east

Natural feature south of road (no barricade), flows into shotcrete and cobble (6-12" roadside drainage that leads to azure a crossing to the east.

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51743
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	23
Lat/Long	32.649794,-115.700754
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northeast



east



north



south



east, AZ crossing



east, AZ crossing

Notes

South to north. Large braided channel from AZ crossing. To the east disturbed along road and riprap piled up at River Right boundary.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51745
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	20
Lat/Long	32.650141,-115.698812
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



north

Notes

20, 6" wide from road, widens to 2'.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51747
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	18
Lat/Long	32.649984,-115.698651
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



west, south of barrier



west, south of barrier



east, south of barrier

Linear feature south of vehicle

barrier, parallel road. Following east,
draining into large culverted
drainage to the east. Concrete and
riprap lined

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51750
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	16
Lat/Long	32.650238,-115.697160
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east



north



northeast

Notes

Sheet flow from desert pavement to larger culverted drainage to the east. Flow 1ft wide, south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51751
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	30
Lat/Long	32.649616,-115.704453
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east



south over barrier



flow under barrier, east



east



northeast

Notes

Arizona crossing, flowing south to north. Drainage continues on both north and south sides of crossing.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51752
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	28
Lat/Long	32.649392,-115.703836
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south



east



south



east



side of border barricade. South of AZ crossing lined with shotcrete and 6-12" cobble. North

east



east



northeast



northeast

side of border barricade. South of AZ crossing lined with shotcrete and 6-12" cobble. North

Notes

Starts south and west of AZ crossing. Mapped rr and rl. Flowing south to north generally. Continues on south

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51753
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	27
Lat/Long	32.649945,-115.702061
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



north



east



east



northeast

Notes

Arizona crossing, flowing south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51755
Survey Date	07/10/2019
User	Lindsay Willrick
Feature Name	Culvert
Lat/Long	32.650248,-115.696894
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east



east



north



south

Notes

Culvert and drainage flowing north,
outside 60' from barrier fence.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51931
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	90
Lat/Long	32.638003,-115.856415
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north RL



northeast



south RL



south



south RR



north RR

Notes

Drainage flows south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51932
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	89
Lat/Long	32.637863,-115.855946
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South of barrier, flowing south to north and sheet flow into road.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51933
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	88
Lat/Long	32.637940,-115.855551
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South of barrier, flowing south to north and sheet flow into road.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51934
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	87
Lat/Long	32.637941,-115.855488
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



southeast

Notes

South of barrier, flowing south to north sheet flow to road

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51936
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.637957,-115.855223
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south

Notes

Swale south of barrier, no ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51938
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.637986,-115.855120
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes Swale south of barrier, no ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51939
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.637973,-115.854858
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south

Notes Swale south of road only, no ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51940
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.638175,-115.854667
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Swale north of road only. No OHWM



JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51945
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	82
Lat/Long	32.638138,-115.852589
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south

Notes

Feature south of barricade, took point. South to north, sheet flow onto road. Does not cross road. 3ft wide

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51946
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.638202,-115.851856
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south

Notes

Swale south of road, no ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51947
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Overside drain
Lat/Long	32.638330,-115.851712
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



east



south swale

Overside drain and swale north side of road, no ohwm. Swale south of road, no OHWM

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51948
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.638260,-115.851298
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes Swale south of barrier, no OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51949
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Overside drain and swale
Lat/Long	32.638425,-115.850830
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Overside drain



swale north of Overside drain.



swale south of road,

Swale on both sides of road.
Overside drain in place for surface
flow of water over road, prevent
erosional rills at low points.

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51950
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.638414,-115.850131
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south

Notes

Swale south of barrier only. No ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51952
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	81
Lat/Long	32.638897,-115.844110
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

North side of road only, flowing
south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51954
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	80
Lat/Long	32.639335,-115.839253
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo





Notes



Flowing over road from south to north.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51955
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale/ erosional rill
Lat/Long	32.639496,-115.836443
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north

Notes

Erosional rill, running from north.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51956
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	79
Lat/Long	32.639644,-115.834118
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northeast

Notes

Flowing west to east

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51957
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	78
Lat/Long	32.639610,-115.834155
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south



north



north

Notes

Flowing south to north



JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51958
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	77
Lat/Long	32.639810,-115.833033
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northwest



northwest



east

Flowing west to east, sheet flow over road with no terminus.

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51959
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	76
Lat/Long	32.639801,-115.830920
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south 15' wide



north



north

Notes

Flows from road and across/under barriers to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51960
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	75
Lat/Long	32.639997,-115.829714
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Flowing south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51961
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.640026,-115.829481
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Swale, no both sides of road. No OHWM indicators.



JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51962
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	74
Lat/Long	32.639972,-115.828846
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north, featurw



south, swale

Notes

Feature flowing from road runoff to the north. No OHWM south of barricade near here.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51963
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.640286,-115.826577
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northwest



south



south

Notes

Swale, no OHWM and heavily disturbed with tire tracks. Both sides of road.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51964
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	73
Lat/Long	32.640444,-115.822848
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

Erosional rill at road edge, concrete and cobble in place what has been washed out. Suggest Overside drain here. Drainage flows south.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51965
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	72
Lat/Long	32.640670,-115.819512
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



extends south only



north swale



north swale



south drainage continues
Bed and bank from road edge extending south under barricade. Swale in north side of road. See photo attached. No OHWM north of rd.

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51966
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.641005,-115.816655
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

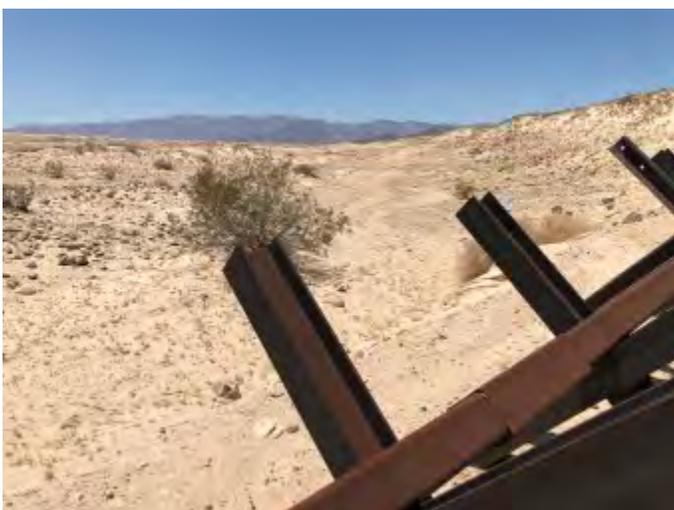
Feature Photo



north



north



south

Notes

No OHWM, road berm more than 2' high on each side.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51967
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	71
Lat/Long	32.649222,-115.761603
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

North of road only, faint OHWM close to rd. More apparent downstream from OHV disturbance.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51968
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	70
Lat/Long	32.640920,-115.812156
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south, tire tracks



faint OHWM



south

Notes

South of barrier no OHWM, very sandy. Swale to south. Flows north from road. Disturbed feature, OHV traffic.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51969
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Erosional rill
Lat/Long	32.641393,-115.811650
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes Erosional rill north side of road. 4ft long and deeply incised.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51970
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	69
Lat/Long	32.641357,-115.810143
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south



north

Notes

South to north flow, mapped across road. Water flow more recent and pushed graded berm down across road.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51971
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.641690,-115.808685
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes North of road only. No OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51973
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	68
Lat/Long	32.641828,-115.806530
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north

Notes

North of rd only, south to north.
Catching flow off road

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51974
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	67
Lat/Long	32.641899,-115.805304
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north

Notes

South to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51975
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	66
Lat/Long	32.642072,-115.803186
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



low point in road, drainage high disturbed by driving OHV



south

Notes

Flow south to north. Both 65 and 66 flow into 66-6' north of road. Heavily disturbed by OHV traffic. OHWM present south of rd, destroyed north of road by OHV.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51976
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	65
Lat/Long	32.641981,-115.802841
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south

Notes

Sheet flow over road connects to 66, feature south of barricade. Flowing south to north.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51977
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.642059,-115.802855
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east edge not connected to 65 point.

Notes

North of rd only. No ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51979
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.642366,-115.798074
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes Heavily disturbed swap feature,
north of rd only. No OHWM

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51980
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.642705,-115.793232
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Both sides of road, no connectivity across. No OHWM

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51981
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.642579,-115.795825
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

Both sides of road, no OHWM

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51982
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.642601,-115.795623
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

North of rd only, no OHWM



JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51983
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	64
Lat/Long	32.642591,-115.794786
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



east



south



south

Notes

South to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51984
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	63
Lat/Long	32.642794,-115.792707
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



southeast



south

Notes

Flows south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51986
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	62
Lat/Long	32.642870,-115.790573
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



spith



south

Notes

Flowing south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51987
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	61
Lat/Long	32.643355,-115.784009
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Flowing south to north

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51988
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.643514,-115.783492
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



soith

Notes

Swale to the north and south of road, no connectivity over road or OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51989
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.643600,-115.782707
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Swale to the north and south of road, no connectivity over road or OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51990
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.643614,-115.782279
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Swale to the north and south of road, no connectivity over road or OHWL.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51993
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	58
Lat/Long	32.643637,-115.781113
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



Notes

Flowing south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51994
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	57
Lat/Long	32.643733,-115.780700
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south



south



south

Notes

Flowing south to north



JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51995
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	56
Lat/Long	32.643867,-115.780194
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



mud cracks



south

Notes

OHWL covered in wind blown sand. Mud cracks evident across finely braided bed. Road bed bermed up on both sides due to road grading and maintenance. Flowing south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51996
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.643961,-115.778064
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Swale extending on both sides of road, no OHWM indicators.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51997
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.644090,-115.776463
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Swale, disturbed with tire tracks. No connectivity over road or south or road. Hill on south side of barricade. No OHWM indicators.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51998
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.644389,-115.772518
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes	Forked swale, north of road only. No OHWM indicators.
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JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	51999
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	55
Lat/Long	32.644672,-115.769350
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south



south



south



east

Notes

Arizona crossing, drainage extends on both sides of road north and south. Sandy-dune substrate. Mesquite bosque.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52000
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.644798,-115.767270
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east



east

Notes

Swale running east to west
somewhat parallel road. No OHWM
indicators. Does not cross road.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52002
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.645567,-115.756334
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Swale on north side of rd, no connectivity over road. Berm on both sides of road from road grading and maintenance. No sign of OHWM.



JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52006
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.647132,-115.735917
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



Notes

Swale on both side of rd, no connectivity over road. Berm on both sides of road from road grading and maintenance. No sign of OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52008
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.647251,-115.734098
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Swale on both side of rd, no connectivity over road. Berm on both sides of road from road grading and maintenance. No sign of OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52009
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.647262,-115.733405
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south



north

Swale on both side of rd, no connectivity over road. Berm on both sides of road from road grading and maintenance. No sign of OHWM.

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52010
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.647341,-115.732785
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south

Notes

Swale on both side of rd, no connectivity over road. Berm on both sides of road from road grading and maintenance. No sign of OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52013
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Erosional rill/swale
Lat/Long	32.648110,-115.726661
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



west



northeast



north



northeast



north



east



southwest

Notes

Erosion from road building, no BMPs in place. OHWM created d/t road runoff. Continues runoff parallel road.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52014
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	Erosional rill/swale
Lat/Long	32.647968,-115.726436
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



west



west



east

Notes

Erosion from road building, no BMPs in place. OHWM created d/t road runoff.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52015
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	51
Lat/Long	32.648508,-115.724252
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

Arizona crossing

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52018
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	49
Lat/Long	32.648484,-115.724462
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

North of crossing, disturbance from vehicular traffic. No feature north of AZ crossing.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52021
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	49a, b, c, and d.
Lat/Long	32.648133,-115.723108
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



north



north



north



south



south



south



south



north

Notes

Braided stream with island in middle. Flows north to south, Arizona crossing to the northern most extent. No visible connectivity over crossing to north, no feature. High vehicular disturbance. May have been used as road over time. No OHWM north of as crossing.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52022
Survey Date	07/11/2019
User	Lindsay Willrick
Feature Name	47
Lat/Long	32.648581,-115.723249
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



southwest



south



south



north



south

Notes

Arizona crossing notes with RR and RL, natural feature flowing south to border.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52064
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.635685,-115.886847
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northeasy

Notes

Swale north of road, running more west to east. No OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52112
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	148
Lat/Long	32.632903,-115.922368
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	
Feature Photo	

Notes Flowing south to north, no photo

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52113
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Rocky swale
Lat/Long	32.632947,-115.922503
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52114
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Rocky swale
Lat/Long	32.632947,-115.922491
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52115
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	150
Lat/Long	32.632848,-115.922450
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52207
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	149
Lat/Long	32.632850,-115.922283
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52209
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.632933,-115.921884
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



north

Notes Three pronged braided feature, swale. No OHWM indicators throughout.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52210
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	148
Lat/Long	32.632836,-115.921324
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



soith



south

Notes

South of barricade, south to north flow into road. Sheet flow.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52211
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.633316,-115.921579
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Swale north of rd. No ohwm



Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52275
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.633030,-115.920596
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northeast

Notes Swale north of rd, no ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52276
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.633176,-115.919544
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northeast



east

Notes Swale north of road. No OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52277
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.633371,-115.916441
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north tire tracks



south



south

Swale in north and south side of road, no OHWM. Tire tracks disturbed on north side of rd.

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52345
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.633418,-115.915604
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north with tire tracks



south



south

Notes

Swale in north and south side of road, no OHWM. Tire tracks disturbed on north side of rd.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52353
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.633385,-115.915485
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



south



south

Notes

Swale north and south of road, no OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52355
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.633607,-115.911521
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

Swale south of border only, no OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52359
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.633903,-115.909463
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes Swale south of road only. No ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52360
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	147
Lat/Long	32.633831,-115.908808
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South to north, sheet flow into road.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52364
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	146
Lat/Long	32.633889,-115.908503
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



soith



Notes

South to north flow, only in south if border. To the north is all road and heavily disturbed.

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52365
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	145
Lat/Long	32.634462,-115.902125
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



bakery road edge rill and sheet flow down to alluvial fan.



north



south



south

Notes

From western terminus at road, flows east to road again. Somewhat parallel to northern edge. Road grading spoils have encroached over OHWM on south edge of feature. Walked line with buffer.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52366
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale erosional rill
Lat/Long	32.634356,-115.901975
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



east

Notes

Erosional rill from road, sheet flow on steep hill, erosion. All south of barricade.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52367
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	144
Lat/Long	32.634420,-115.901727
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south

Notes Flowing north to south, south of road only

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52368
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.634394,-115.901678
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northwest

Notes

Swale north of rd. No OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52369
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.634562,-115.901128
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



west

Notes

Swale no OHWM or staining on rocks. Drains into 142

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52370
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	143
Lat/Long	32.634484,-115.900154
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south



south



south



northwest



recent grading

Notes

Braided feature gently sloping to the north of road. south of barrier and road deeply incised.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52371
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	142
Lat/Long	32.634512,-115.901103
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south rr



east



east



north

Notes

Braided feature from north to south, no OHWM across road but more recent grading effort show flow may have been more recent (2019 storm event?).

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52372
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale/ponding area
Lat/Long	32.634596,-115.899029
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south of barrier mud cracks



south mud cracks and ponding



north



south

Notes

Mud cracks and evidence of water ponding at south edge of road adjacent vehicle barrier. No OHWM and road and heavy disturbance to the north.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52373
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	141
Lat/Long	32.634831,-115.895605
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south rl



south rl mud under barrier



mud cracks and pounded water west of RL line. doesn't cross as crossing



rr hard to detect to south



south



mud cracks middle of road, north edge of ax crossing



rr less defined



concrete staining

Notes

Concrete staining and mud cracks

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52374
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	140 rr
Lat/Long	32.635076,-115.893174
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



mud under barricades at rr



north rr



north rr



west, concrete stianing

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52375
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	140
Lat/Long	32.635017,-115.893919
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east



mud under barrier showing flow



north rl





Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52376
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Ponding/mudcracks
Lat/Long	32.635083,-115.893114
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south



east

Water flowing down concrete in hill and channelized along southern edge. Ponds south of border. Took gps point. Deep mud cracks

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52377
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	139
Lat/Long	32.635104,-115.892655
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



west

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52378
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	138
Lat/Long	32.635129,-115.892369
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



soith



west

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52379
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	137
Lat/Long	32.635157,-115.892260
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



west

Notes

Flowing from south to north and turns west to parallel road. Flows immediately under barricade. Features 138 and 139 flow into it and also parallel road.

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52381
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.635209,-115.892401
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes	Swale north of road, no OHWM indicators
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JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52421
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	136
Lat/Long	32.635319,-115.891079
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



east, first head cut is 136, second is 135 closest to photographer.

Notes

Erosional rill, Overside drain recommended here. Head cutting into road east do top of large AZ crossing

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52422
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.637937,-115.857027
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Would flow into 90, no OHWM.
North of road only

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52423
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.637955,-115.856833
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



northeast

Notes Swale on north side of road, no OHWM.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52448
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	135
Lat/Long	32.635309,-115.891120
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



east



north



north

Erosional rill, Overside drain recommended here. Head cutting into road east do top of large AZ crossing

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52449
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	134 Overside drain
Lat/Long	32.635408,-115.890058
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

Overside drain north side of road, steep slope unable to walk line. Drainage flows south to north, 20' long and 1' wide.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52450
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Overside drain 133
Lat/Long	32.635410,-115.889415
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north

Notes

Overside drain north side of road, steep slope unable to walk line. Drainage flows south to north, 20' long and 1' wide.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52451
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.635547,-115.888773
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Swale north of road, no OHWM indicators

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52452
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636593,-115.874861
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Swale north of road, no OHWM indicators

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52453
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.635860,-115.885203
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south

Notes Swale south of road, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52454
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.635834,-115.884240
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



soith

Notes Swale south of road, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52455
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	132
Lat/Long	32.635875,-115.884031
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north

Notes

Overside drain 1.5', steep drainage no line drawn. Extends down hill, first 20' are 4' wide.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52456
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	131
Lat/Long	32.635967,-115.882906
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north

Notes

Overside drain 1.5', steep drainage
no line drawn. Extends down hill,
first 20' are 5' wide.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52457
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	130
Lat/Long	32.635965,-115.881068
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

Drainage flows south to north, sheet flow across road

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52458
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Overside drain swale
Lat/Long	32.636103,-115.880837
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north

Notes

Overside drain 1.5'. Swale north of road, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52463
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636181,-115.880102
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north

Notes

Swale north of road, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52464
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	129
Lat/Long	32.636319,-115.877605
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



south



south

Notes

Overside drain north side of road, drainage flowing south to north. Drainage south of road bermed up by vehicle barrier construction and grading at that time, has not flowed across road recently but bed and bank apparent in feature.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52466
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636377,-115.877415
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes Swale north of road, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52469
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636382,-115.877274
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes Swale north of road, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52476
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	128
Lat/Long	32.636285,-115.877122
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes Drainage growing south to north,
sheet flow over road

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52478
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636379,-115.877034
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north

Notes

Swale north of road, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52480
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636403,-115.876925
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes Swale north of road, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52481
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636422,-115.876777
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes Swale north of road, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52482
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swalw
Lat/Long	32.636449,-115.876626
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes Swale north of road, no OHWM
indicator

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52483
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636434,-115.876505
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes Swale north of road, no OHWM indicator

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52485
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	126
Lat/Long	32.636310,-115.876575
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



southwest

Notes Flowing south to north, sheet flow into road

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52490
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	93
Lat/Long	32.637337,-115.864301
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south



south



north

Notes

Flows south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52491
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636416,-115.876470
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes Swale north of road only, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52493
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	125 Overside drain
Lat/Long	32.636489,-115.876383
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



Notes

Overside drain 1.5' wide, drainage flowing off road south to north.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52495
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636410,-115.876112
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

Swale south of barrier, no OHWM indicator

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52496
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636470,-115.875904
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes	Swale north of road only, no OHWM indicators
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JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52524
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	124 Overside drain
Lat/Long	32.636523,-115.875667
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



south



south

Notes Overside drain 1.5' wide, drainage flows south to north. North and south of road

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52527
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	123 Overside drain
Lat/Long	32.636521,-115.875347
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



Notes

Overside drain 1.5' wide, drainage flows south to north. North of road only

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52528
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636510,-115.875086
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Swale north of road only, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52530
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	122 Overside drain
Lat/Long	32.636551,-115.874758
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



north

Notes

Overside drain 1.5' wide, drainage flowing south to north. North side of road only.



Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52531
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636592,-115.874674
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes Swale north of road only, no OHWM indicators

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52532
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636601,-115.874327
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes	Swale north of road only, no OHWM indicators
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JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52533
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636645,-115.874217
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Swale north of road only, no OHWM indicator

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52534
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Overside drain and swale
Lat/Long	32.636617,-115.873654
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Overside drain north of road, no OHWM indicator

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52535
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636791,-115.870255
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes Swale north side of road only, no OHWM indicator

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52536
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	121
Lat/Long	32.636581,-115.872561
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



morth



north

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52537
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	120
Lat/Long	32.636559,-115.872362
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52540
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	117
Lat/Long	32.636696,-115.871814
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52541
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	116
Lat/Long	32.636713,-115.871753
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52544
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636845,-115.871572
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes	Swale north of road o my, no OHWM indicators
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JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52545
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	115
Lat/Long	32.636734,-115.871488
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



soith



south

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52546
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	114
Lat/Long	32.636765,-115.870896
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52548
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	113
Lat/Long	32.636789,-115.870774
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52549
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636934,-115.870058
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

Swale north of points 108-112, no connectivity over road and no OHWM indicators.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52550
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale/ erosional rill
Lat/Long	32.636796,-115.870249
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes Swale south of road only, no ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52551
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	112
Lat/Long	32.636808,-115.870131
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52552
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	111
Lat/Long	32.636806,-115.870089
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52553
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	110
Lat/Long	32.636847,-115.869902
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52554
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	109
Lat/Long	32.636829,-115.869684
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



soith

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52555
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	108
Lat/Long	32.636834,-115.869649
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52556
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Overside drain
Lat/Long	32.636969,-115.869543
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes No OHWM indicator north of drain

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52557
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	106
Lat/Long	32.636867,-115.869190
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south



South of road flowing south to north and sheet flow over road. Swale north of road

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52558
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	105
Lat/Long	32.636891,-115.868959
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes South side of road only, sheet flow to road. South to north flow.

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52559
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.637054,-115.868899
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

North of road swale, no OHWM indicators. South side of road is feature 105

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52561
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	104
Lat/Long	32.637070,-115.868712
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



north



south



south

Overside drain 1.5' wide. North of road drainage 1' wide. South of road 3' wide.

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52562
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.636993,-115.868409
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north

Notes

North side of road only, no ohwm

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52563
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	94
Lat/Long	32.637290,-115.864654
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



north

Notes

6ft north of rd. Flowing south to north

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52564
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	95
Lat/Long	32.637228,-115.865130
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South to north, only on south side of road under barricade. Turns into sheet flow on road

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52565
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.637214,-115.865387
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north west

Notes Erosional rill adjacent road. North side only

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52567
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	97
Lat/Long	32.637313,-115.866742
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north rl



south rl



south rr



north rr



weat

Notes

Flowing south to north.

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52568
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	98
Lat/Long	32.637060,-115.866835
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52569
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	99 and 100
Lat/Long	32.637064,-115.867006
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south



south

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow. 99 and 100 meet at road edge and become 6' across total. Each individually 3' upstream.

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52570
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.637107,-115.868121
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



north



south



erosion on south edge into road

Swale north and south of road, no OHWM. Some erosion into road, not considered ohwm

Notes

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52571
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	103
Lat/Long	32.637027,-115.867649
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52574
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	Swale
Lat/Long	32.637026,-115.867244
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south

Notes

Swale south of road only, no OHWM indicators. Western most edge of larger system.



JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52575
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	102
Lat/Long	32.637031,-115.867114
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow

JD Feature Photo Log 2

Project	El Centro Fence Replacement Project 2019 - Surveys
ID	52576
Survey Date	07/12/2019
User	Lindsay Willrick
Feature Name	101
Lat/Long	32.637031,-115.867100
Latitude	
Longitude	
Speed	
Direction	
Altitude	
Accuracy	

Feature Photo



south



south

Notes

South of road only, no connectivity to anything on other side. Sheet flow to road. South to north flow